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DIESEL RAILWAY TRACTION SUPPLEMENT

The October issue of THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price* 1s.

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DISPATCH OF "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and machinery for such dispatch, and any reader desirous of arranging for copies to be delivered to an agent or correspondent overseas should place the order with us together with the necessary delivery instructions.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas, as they are stopped under the provisions of Statutory Rules & Orders No. 1190 *of* 1940

Deep Level Shelters and Railways

CONTINUED nightly aerial bombardment, such as London has had during the past few weeks, has altered the complexion of air raid shelters as envisaged by the Ministry of Home Security before the war, for it is now not merely a question of protecting the population from the effects of blast and falling fragments, but also of affording reasonably safe dormitory accommodation. Accordingly, the possibilities are being considered of using railway tunnels, derelict and otherwise, and we have already made reference in our columns to such examples as the derelict City & South London Railway tube tunnels in Southwark, the adaptation of the Aldwych branch as a dormitory shelter, and the use of abandoned main-line tunnels in places as far apart as Dundee, Harrogate, and Ramsgate. Nor is this movement combined to Great Britain, for the civilian population of Malta owes some of its immunity from serious casualty to the existence of the Valletta tunnel of the old Malta Railway. Another aspect of the situation is provided by the recent suggestion of the New York Transportation Board to build air raid shelters along Second Avenue in such a way that they may be linked eventually by tunnels, and so converted into an underground railway. The last-named admirable suggestion is no novelty, however, nor is it an idea originating in the U.S.A., for it may be recalled that as long ago as July 14, 1939, we described the proposals of Mr. E. W. C. Kearney that tubes on his familiar gravity and mono-rail principles should be undertaken, with the object of providing air raid shelters in congested urban areas. His plans, which were formulated more than 2½ years ago, would seem to have been regarded as premature at the time, and too slow of achievement now that the *Blitzkrieg* is upon us. Meantime, the existing tube stations in London are perforce being used as dormitories.

* * * *

Action against Pullman U.S.A. Group

A civil action under Federal anti-trust laws has recently been instituted by the Federal Department of Justice against the Pullman (U.S.A.) group of companies. It is set out in the complaint that the Pullman organisation owns and operates virtually all sleeping cars used in the United States and is the largest manufacturer of railway rolling stock in that country. The operating business is performed by the Pullman Company and the manufacturing business by the Pullman-Standard Car Manufacturing Company. Both of these corporations are owned by Pullman Incorporated, which is merely a holding company. It is alleged that the defendants have refused to operate modern lightweight equipment purchased by the railways from any manufacturer other than the Pullman-Standard Company. The defendants, it is also stated, are not subject to the regulation of the Interstate Commerce Commission as to those activities which are charged to be unlawful. Reference to this action is made in the latest quarterly report of Pullman Incorporated which vigorously repudiates the basic allegation of restraint of trade made by the Department of Justice and points out that the Pullman Company has furnished to the railways several hundred lightweight sleeping cars of the most modern type. The report further states that the action attacks a business which during its long history since incorporation in 1867 has developed naturally into the present large-scale operation, as the result of economic forces and in response to the demands of the railways and the public for sleeping-car service on a unified nationwide basis that could best be rendered by the Pullman system of pooled operation.

* * * *

Stations to Display Names Again

Travellers who have found the wartime obliteration of names on stations disconcerting, not only when using an unaccustomed route but also when suddenly aroused from reverie on what should be a familiar line, will welcome an

Order which has been made by the Minister of Transport. This authorises the railway companies to replace station names provided that they are situated under the station roof and cannot be seen and understood from the highway or from low-flying aircraft. There is little doubt that when the original Order was issued, with the object of depriving air raiders and parachute troops of any indication of the area in which they might find themselves, it was followed by an obliteration of names that went much further than was intended. It was not the intention of the Minister, apparently, that the Order should apply to the large towns or to most of the railway stations in the London suburban area, but in practice the enthusiasm of the obliterators led them to remove all marks of identification and to vie with one another in the creation of anonymity. The resulting inconvenience to railway travellers was so great that the Minister for Home Security soon issued an amending Order authorising the Minister of Transport to allow names to be displayed in certain circumstances. Now the direction is that there is to be no limitation of the size of lettering used under cover where the names cannot be read from highways or by low-flying aircraft, and lettering not exceeding 3 in. in height may be used in the open provided they are similarly undecipherable to all but those for whom they are intended. The railways are taking immediate steps to avail themselves of this concession, but in view of the emergency calls made on the staffs at the present time it is not to be expected that every station will soon resume its once-familiar description.

* * * *

Destination Boards

In a country so nearly anonymous as ours at the present time, it comes as a mild but pleasant shock to see an express train boldly proclaiming its destinations on the carriage roofs. This concrete evidence of a strong tide of traffic still flowing more or less according to schedule between our large towns is an encouraging counterblast to stories of chaotic conditions outside the limited areas within which most of us now are obliged to confine our movements. So "Paddington, Exeter, Plymouth & Penzance," "King's Cross and Edinburgh," "Euston, Birmingham & Wolverhampton," and all the other familiar peacetime combinations have become more than useful guides to the right carriage. They are as much a contribution in their way to morale as the continued cleanliness of certain main-line locomotives to which we have already referred, and they are among the dwindling printed records available to the public of the names by which our centres of population used to be known before the war. As for the nameboards of our surviving named expresses, they are a reminder of our unconquerable attachment to "business as usual," however impracticable in total war, and the sight of one portion of such a train running into a station nearly 300 miles from London only 15 minutes late during a week of heavy air raids, did us almost as much good as a speech by Mr. Winston Churchill.

* * * *

Overseas Railway Traffics

Argentine railway traffics for the eleventh and twelfth weeks of the current financial year have a depressing appearance relieved only by the increase of 15,000 pesos shown by the Buenos Ayres Great Southern in the eleventh week. The Great Western of Brazil for the first 38 weeks of 1940 has an advance of £66,600 and of 2,189 contos, the Leopoldina for the same period is up £85,012, and the San Paulo figures have improved to the extent of £166,145. On the Central Uruguay there is a gain of £9,433 in the twelve weeks, but currency figures are $273,750 down.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Increase or Decrease
Buenos Ayres & Pacific* ...	12th	1,125	160	13,329	1,571
Buenos Ayres Great Southern*	12th	1,769	114	22,716	147
Buenos Ayres Western* ...	12th	625	177	7,287	901
Central Argentine*	12th	1,363	550	16,580	7,809
		£	£	£	£
Canadian Pacific	38th	707,400	194,400	23,350,600	3,458,600
Bombay, Baroda & Central India	24th	254,325	1,200	4,485,825	515,475

* Traffic returns in thousands of pesos.

Canadian Pacific gross earnings for the first eight months of 1940 totalled £21,240,200, an increase of £4,016,000 in comparison with those for the first eight months of 1939, and the net earnings of £3,461,000 showed an improvement of £2,084,400.

* * * *

Earthquakes and Structures

Mr. Laugharne Thornton's recent paper to the Royal Society of Arts upon "Earthquakes and Structures" lays emphasis on certain important points, such as that piers and piles should be well capped and tied together to form a continuous system, so as to insure even distribution of load over the foundations of any structure during the most severe phase of a shock period, because stresses on foundations tend to increase with repeated shocks. Reinforced concrete columns should be designed to withstand the combined effects of bending, shearing, and torsional stresses likely to be produced by an assumed displacement of the ground. Measures must be taken to prevent the concrete casing around the reinforcement from cracking and falling away from it during the early phase of an earthquake, leaving the reinforcement unsupported during the later phase. Windows and doors of buildings should be at a common level so that continuous beams or lintels may be provided across the openings. Roofs should be low-pitched and arches should be flat with easy curves at the abutments. Allowance must be made for abnormal loads transmitted to walls through trusses, and it has to be remembered that the impact of earthquake shock is by no means instantaneous and may synchronise with the natural period of vibration in a truss, beam, or column, with a resulting motion that is a forced and not, as is usually supposed, a free vibration.

* * * *

Ceylon Government Railway

Competition by road hauliers continued to affect the earnings of the Ceylon Government Railway in the year ended September 30, 1939. There was not time for the Motor Car Ordinance which came into full operation in June, 1939, to make itself felt. Rail traffic from Colombo was also diminished by the opening of centres at Jaffna and Batticaloa for the stocking of goods on a large scale for wholesale distribution.

	1937-38	1938-39
Miles open	951	951
Passengers	10,859,072	10,705,516
Merchandise, tons	907,116	894,519
Train-miles	4,510,019	4,705,675
Operating ratio, per cent.	124·99	129·66
	Rs.	Rs.
Passenger receipts	6,060,079	5,836,581
Merchandise receipts	8,266,012	7,979,272
Gross revenue	16,128,529	15,441,208
Ordinary working expenses	20,158,835	20,021,602
Renewals fund	109,226	
Net deficit	4,139,532	4,580,394

The renewals fund has now ceased to exist with the decision that all expenditure on renewals works was to be met from loan funds repayable by annuities.

* * * *

Heavy Traffics in the U.S.A.

The recent large-scale troop movements in the U.S.A. have been spectacular and have attracted wide attention, partly because they are said to have been the largest since the world war and to have involved a three-day peak not equalled even in that conflict. Nevertheless, the U.S.A. railways frequently handle in very short periods much larger volumes of travel than any line has so far been called upon to carry in connection with these Regular Army and National Guard manœuvres. For example, every favourable week-end, during the summer months, the Pennsylvania-Reading Seashore Lines handle to and from the resorts of Southern New Jersey, grouped in a 40-mile stretch of beach, a round-trip movement of approximately 100,000 passengers—50,000 to the shore and 50,000 back—involving the operation of nearly 300 trains. About an equal volume of week-end traffic is similarly moved to and from resorts reached by the Long Island Railroad. Practically the entire rush to the beaches is concentrated in a few hours beginning at noon on Saturday, and the returning tide in a similar shore period late Sunday afternoon and evening. At the last presidential inauguration, that of 1937, the Pennsylvania Railroad alone operated 99 special trains to and from Washington, and handled 50,000 passengers in and out of the capital in one day. The Army-

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Navy football match at Philadelphia averages about 80 special Pennsylvania trains and more than 45,000 inbound and outbound passengers. Governor's Day at Sea Girt, New Jersey, requires about an equal number of trains and the handling of some 60,000 passengers arriving and departing.

* * * *

Well-known U.S.A. Signal Box Destroyed

On July 22, 1940, one of the best-known power signal boxes in the U.S.A. was completely destroyed by fire. It was of the electro-pneumatic type, containing 262 working levers, and controlled the large 42-track terminal station at St. Louis, Missouri, which is used in common by all the railways serving that city and was erected in 1903, when the entire layout was reconstructed in anticipation of the heavy traffic expected to result from the World's Fair. Thirty-two tracks were then provided, 10 more being added on the western side of the station in 1930, making it the largest terminus, in this respect at least, in the U.S.A. The power signalling installed in 1903 included 11 signal boxes, in addition to that now destroyed, containing in all 968 levers, and was a very remarkable piece of work for its day. The approach lines for some distance had 3-aspect semaphore automatic signalling. Their arrangement was somewhat peculiar, all trains, from east or west, running beyond the base of the Y-formation and backing in, to avoid steam locomotives standing under the station roof. The signal engineers of several of the user railways conferred after the fire, the cause of which at present remains unexplained, and one offered a power frame he had on hand which could be adapted for use. It was hoped to get rid of emergency working in about 90 days.

* * * *

Economies of Rail Lubrication

Although thousands of rail lubricators have been installed on railways during the last few years, little has been published as to the extent of the economies which they have effected. The results given in a report presented at the last convention of the American Railway Engineering Association are, therefore, of interest. They relate to certain experiments made on the Denver & Salt Lake Railway, where 14 mechanical lubricators have been installed between Utah Junction and the east portal of the Moffat tunnel, a distance of 45½ miles of severely curved line, which for the greater part of the distance has a gradient of 1 in 50 compensated for curvature. The total rise in 40 miles from the 5th mile post out of the Utah Junction to the Moffat tunnel is 3,775 ft. Tests were made before and after the lubricators were brought into action, and the net result was to establish that their effect was to reduce curve resistance about 50 per cent., and that the normal tonnage hauled up the grade could be increased by 2.6 per cent. The latter figure is of chief importance to the traffic department as representing an appreciable increase in earning capacity. As to the 50 per cent. reduction of curve resistance, that means important economies in rail and flange wear.

* * * *

A Lot in a Name

When the villain of melodrama recoiled from a stinging slap on the cheek delivered by the heroine in defence of her good name, it was often to hiss " you little spitfire." Off the stage, the epithet was seldom heard until its present astounding return to a new dignity and unchallenged public popularity. Those who before the war racked their brains to find names for locomotives and express trains that would excite interest and stimulate patronage of railway services may well stand amazed at the success of " Spitfire " in charming money from the public pocket. It is a success most richly deserved, although sometimes we feel it tends to rob other deserving aircraft of a merited esteem. In fact today " Spitfire " has become almost a generic term for a fighting aeroplane, just as once Flying Scotsman (or garbled versions thereof) was loosely applied in the popular press to various expresses. Like Flying Scotsman and Cornish Riviera, the name " Spitfire " has grown into a tradition, and deserves—although in the whirlwind progress of aircraft design it may not achieve it—as long a hold upon public respect.

Rail and Road

IN our correspondence columns (page 349) we publish a most interesting letter from Mr. Frederick Smith. Put very briefly, his proposal is that railway freight services should be restricted to selected trunk routes and that railheads should be established from which motor vehicles would collect and distribute the traffic to destination. It is a big subject and, of course, not a new one. As Mr. Smith knows, the railways have done a great deal in this direction already, but his scheme is admittedly much more drastic. It is largely a problem of economics. Railway services cannot be separated into long-distance and short-distance. Wagons for long distances are conveyed by short-distance trips. If the whole of the short-distance traffic could be transferred to road vehicles, there would be very little saving of train mileage, for the trains would still have to run to serve private sidings, to convey coal and other heavy low-grade traffic to stations, and so forth. Bearing this in mind, if the variable costs were extracted for the carriage of the short-distance traffic by rail and these were compared with the costs of carriage by road, the former would in most cases be the cheaper. It is always difficult to generalise on this subject; one needs to examine the facts in every case. The railways have found that, in some instances, motor vehicle distribution from railheads is more expensive than rail conveyance. The question of transferring traffic from rail to road must primarily have regard to railway economics. If there is agreement between rail and road (such as we all hope will be the case) the problem will be simplified, but even then the transfer of short-distance traffic to the road will have to be compensated by long-distance traffic being transferred back to rail. There would, however, still remain the need for railway short-distance services.

The railways can do very little to continue their work in this direction in present circumstances. Branch lines, for instance, no less than main lines, are fully employed. There is no part of the railway system which is not now of vital importance, and it is fortunate for the nation that railway facilities have not been curtailed but have been maintained at a high standard of efficiency. The prescience of the railway managements in the years before the war, in steadily pointing out (often in the face of severe criticism) the important part which railways would be called upon to play in wartime, is not always remembered nowadays. Mr. Smith states that there has been virtually no criticism from the railways of his views. If by this he means during wartime, it is necessary to bear in mind the ambiguous position of the railway companies on such matters in Government control, which has several times been referred to in THE RAILWAY GAZETTE. If Mr. Smith means during peacetime, the policy of the railway companies, *e.g.* on branch lines as explained at length to the Railway Rates Tribunal at the annual review of charges in 1939, should not be overlooked. Similarly, the erroneous suggestion that railway wagons are loaded to " only about one-third " of their capacity has been replied to on many occasions by the railways. The short answer is that wagon capacity in terms of tons is a maximum *weight* capacity and that a 12-ton wagon can be loaded to its maximum cubic feet capacity with a weight of only 6 cwt.

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The Taff Vale Railway: A Notable Centenary

AT a time when the vast energies and resources of the South Wales industries are being devoted, for the second time within a quarter-of-a-century, to the war effort of the nation, rather more than academic interest attaches to the centenary of a railway which has surely as great a claim as any other to have played a major part in fashioning and strengthening the industrial machine of this region. Apart, however, from such consideration, the centenary of the opening of the first section of the Taff Vale Railway, over the 16 miles between Cardiff and Abercynon (then known as Navigation House) on October 9, 1840, has great significance from the purely railway historical aspect. The Taff Vale was not the first railway in Wales, being antedated by the Swansea & Mumbles (1806) and others, but it was certainly the first of any great commercial importance in the Princi-

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pality, as was it also the first to enter the railway business in that region with locomotive operation of both passenger and freight traffic from the start. First in the field with the provision of railway service for the already rapidly expanding coal-mining and ironworks industries of the Merthyr district, and later of the Rhondda and neighbouring valleys, the Taff Vale Railway was promoted by the leading ironmasters, coal exploiters, and shippers, with a view to supplementing (and soon supplanting) the fairly extensive but primitive and tedious road, canal, and tramroad facilities which linked these growing centres of production with Cardiff and the Bristol Channel. The company's Act of incorporation (6 Will. IV, cap. 82) of June 21, 1836, contains various references to the numerous early tramroads connecting with or adjacent to the main line between Cardiff and Merthyr; a number of these tramroads had been constructed as feeders to the Glamorganshire Canal under the latter's Act of 1790, and among them was the Pen-y-Darran (locally known as Plymouth's or Hill's) Tramroad from Dowlais Ironworks to Navigation House, made famous by the adventures of Trevithick's locomotive.

Another notable association with the origins of the Taff Vale Railway was the appointment as engineer of I. K. Brunel, who laid it out to the 4 ft. 8½ in. gauge and with easy gradients save at one point between Navigation House and Quaker's Yard, where he was forced to provide a cable-worked incline (replaced by a deviation in 1864) having a rise of 1 in 19 for a quarter-of-a-mile and then at 1 in 22 for a similar distance. Unlike his practice on the neighbouring Vale of Neath Railway and in Devon and Cornwall, Brunel provided stone arch river bridges. The Cardiff—Navigation House section of the railway was opened for public traffic on October 9, 1840, but a ceremonial train for the directors and their friends had made a trip to Pontypridd and back the previous day, when in contravention of a clause (later repealed) in the company's Act limiting the speed to 12 m.p.h., a rate of 40 m.p.h. is reputed to have been attained. Other curiosities associated with the early days of the Taff Vale were the running of trains on the right-hand track, the operation of mineral trains (until the present century) without rear brake-vans, and regulations that all stationmasters must be married, and that pass-holders had to ride " at all times in a sitting position " in the fourth wagon from the rear!

The main line to Merthyr, opened throughout on April 28, 1841, was doubled in 1857, and meanwhile the system was extended rapidly into the Aberdare and Rhondda Valleys, tapping and developing what soon became the finest steam coal district in the world. Although the company achieved phenomenal activity and prosperity, operating the densest mineral traffic in the country and attaining the highest dividends of any British railway (17½ per cent. on the ordinary stock in 1882, before the competition of the Barry Railway and the capital reorganisation of 1889), it also engaged in fierce, relentless, and costly legal and Parliamentary warfare with competitive railways and with Cardiff dock interests, whilst at times its fortunes swayed sharply up and down with those of the coal export industry which it helped to create. Its battle with the Associated Society of Railway Servants in 1900-01 led to the famous " Taff Vale Case " which has become a classic in railway and trade union law, for it represented the first great legal clash between railway management and organised labour, with a conclusion decisively in favour of the former.

Although in mileage the Taff Vale was smaller than the Cambrian Railways, it was in all other respects the largest and by far the most important, other than the Great Western Railway itself, of the constituents of the Western group under the Railways Act of 1921. In the last full year before it became part of the G.W.R. system on January 1, 1922, the Taff Vale Railway conveyed more than eight million passengers (all short-distance traffic) together with 471,000 tons of merchandise, 7,798,000 tons of coal and coke, and 190,000 tons of other minerals. It brought to the Great Western 274 locomotives, 408 passenger train vehicles (incidentally, it had been a pioneer of steam rail motor cars), and 2,372 goods vehicles; its loaded train miles exceeded 1,400,000 annually. The issued capital amounted to over £10 millions and capital expenditure to more than £6¾ millions, and as late as 1921 the ordinary dividend was 4 per cent.; in relation to little more than 120 route miles of line, the year's gross receipts of £2,391,000 and net revenue of over £454,000 were remarkable figures. The centenary of the Taff Vale is therefore that of a remarkable railway, whose background and story have fortunately been recorded by a competent modern historian.* Its surviving personnel and modernised assets are now devoted to the Great Western Railway's responsible task in the present war, and it may be apposite to recall that in the 1914-1919 war some 1,060 T.V.R. employees, 86 of whom gave their lives, served with the colours.

* * * *

Deaths on the Road and from the Air

PUBLICATION by the Ministry of Transport of the statistics of deaths in Great Britain resulting from road accidents during the month of August enables a comparison to be made between the experience of a year of war and the previous twelve months of peace. The August figure of 729 deaths from road accidents compares with 618 in the same month of last year, and raises the total for the twelve months to 8,350, which goes against 6,632 fatalities in the previous period. For the sharp increase in the later figures there are several reasons, although it is impossible to ascertain their order of importance, or even their strict validity, until further experience of wartime working has been gained. It is significant that practically the whole of the total increase had been established in the first four months of the war. During the period September—December, 1939, deaths from road accidents totalled 4,133 as compared with but 2,494 in the same four months of 1938. The early prohibition of street lighting and the improvised dimming of lights on vehicles obviously played a large part in the make-up of figures which have become notorious. With greater familiarity on the part of both drivers and pedestrians with the changed conditions, and also with the technical improvements which were made in the lighting arrangements, the accident figures began to drop, and early this year the monthly totals in some cases compared favourably with those for 1939. It will be necessary to await the next few months before reaching final conclusions as to the effect of blackout conditions on night driving, but, with the lessons of the past year and the better lighting regulations and arrangements which are expected to operate this autumn, there seems to be reasonable ground for expecting that the unfortunate statistics of the final quarter of 1939 will not be repeated.

On the other side of the picture consideration must be given to the smaller number of vehicles on the roads and their much restricted use during the war. The actual aggregate of vehicles licensed and available for operation is probably little less than during peacetime, but the restrictions on petrol have undoubtedly occasioned a much lessened use of the vehicles and the consequent diminution of the numbers to be found on the roads at any one time. So far as the private motorist is concerned, there is little doubt that in present circumstances his use of the roads is rightly restricted almost exclusively to business travel, and the consequent reduction in use of private motorcars at week-ends, when the pedestrian, who always bulks largely in the casualty figures, is most free to wander abroad, might be expected to have a favourable effect on the statistics. In point of fact, long experience has been that the week-end travel habits of the people played little part in the death roll on the roads and that by far the greater number of fatalities occurred during the business rush hours.

In recent months the British public has also grown accustomed to another source of civilian casualties—those arising from enemy air attack. It is not possible to give comparable figures to those of road deaths over the full period of the war, for the system of announcing air raid casualties is a recent development. In July 258 deaths and 321 injuries resulted from air attack and in August the similar figures were 1,075 and 1,261. The Prime Minister, in the House of Commons on September 17, brought the statistics up to the first half of September when he stated that during that period about 2,000 civilians had been killed and some 8,000 wounded, and added that four-fifths of these casualties had occurred in

* *The Taff Vale Railway*, by D. S. Barrie. The Oakwood Press, 1939

London. When the final figures for the month are made known there is little doubt—for in the second half of the month there was certainly no relaxation in the raids—those figures will be considerably swollen. In two-and-a-half months of increasing intensity of air bombardment therefore the number killed was over 3,300. The figure is sufficiently serious, more especially when it is linked with the knowledge of the wanton and indiscriminate manner in which it has been built up, and with the destruction to property which goes with it. At least it can be said for it that it is a direct product of a war that is being waged by a relentless enemy who seeks to attain his end largely by the terrorism of the civilian population. Put against the regular toll of the roads, with its steady drain on the people of this country in time of peace and war, the size of the air raid casualty figure loses a good deal of its importance. Possibly because the road casualties have for long been so constant a feature of our daily lives they have come to be regarded almost with complacency. As a national problem they are certainly not less serious than those arising from enemy action, for they represent a long term problem which will not be solved by the cessation of hostilities.

LETTERS TO THE EDITOR

(*The Editor is not responsible for the opinions of correspondents*)

Economies from Full Loading

25, Green Lane, Northwood, Middlesex
September 27

To the Editor of The Railway Gazette

Sir,—Upon first reading the short editorial under the heading " Begging the Question " in page 189 of The Railway Gazette of August 23, 1940, discussing my proposals for the complete reorganisation of railway operating, with the object of attaining full loading of wagons and trains between concentration centres, and the full use of road vehicles for movement to and from those centres, I thought you were doing less than justice to my views by over-emphasising the closing of small stations and branch lines. Upon reconsideration, however, it occurs to me that I have not, perhaps, made myself as clear as I ought to have done, although I did attempt, in the paper I read to the Institute of Transport at Leeds, on January 10, 1939, to put things in their right perspective. Perhaps I may quote the paragraphs from that paper which are the kernel of my proposals :—

" . . . They (the railways) will really have to look for substantial economies in operating if they are to achieve a sufficient improvement in their net revenue position to justify the view that they are once more upon a stable basis.

" What are the weaknesses of the railway operating position which quite patently must be cured ? What is the test by which operating efficiency can be determined ? To answer these questions, we have to go back to the fundamental purpose of a railway or indeed of any transport system. The purpose, and the sole purpose, is the carriage of goods from one place to another, and it is necessary, therefore, to find out whether the instruments used for the purpose are efficient or otherwise. The test of efficiency in transport, as in other matters, is based upon the extent to which available resources are remuneratively employed. In mechanics, the test is as to energy put into an object, and energy taken out. The factor of efficiency in railway transport must inevitably be the extent to which engine power is employed within its capacity, and this, in turn, depends upon the tonnage hauled by the engine, and again upon the relationship between payload (tons of goods carried) and wagon capacity.

" The most striking feature about railway operation is the very low average load per wagon of general merchandise (Classes 7 to 21) which, assuming a general average wagon capacity of 10 tons, is only about one-third of that capacity. For every ton of goods carried, the engine has to haul about 2½ tons of dead weight. In addition to this, trains generally haul loads which are substantially below the maximum of which they are capable, and again, the turn-round of wagons is so slow that if you take the total capacity of the wagons in terms of tons per day, the actual weight carried by a wagon in the course of a year must be something like 5 per cent. of its capacity. If the same test were applied to the shipping business, and to the road transport business, it would be generally agreed that there was very grave lack of efficiency.

" You will, I hope, realise that I am talking about efficiency in terms not at all disparaging to the management. . . . I am merely using the term ' efficiency ' as it is understood in mechanics . . . as the remunerative employment of resources in relation to capacity. It is my case that this inefficiency in railway operating is not due to any lack of effort on the part of the management to get the very best out of their resources within an operating economy such as has been practised for many years, but I do assert most emphatically that it is precisely that method of operating which has brought the railways into the grave position in which they find themselves today. No large-scale changes were possible, however, because of the dead-hand of legalism.

" In considering the traffic position as a whole, it must be observed that, of the very large number of towns and villages in this country (about 39,000) only a comparatively small proportion (7,300) have railway stations, and even in those cases where there are stations, there is, at any rate in relation to general merchandise, always a terminal cartage or haulage service of some kind or other necessary.

" In the past, the nature of the cartage service was determined by the economic range of the horse, and if you will look at a good road and railway map of the country, say in the year 1913, you will see at once that there were a very large number of towns and villages quite beyond the economic range of the horse from a railway station, and in consequence the railway companies made no attempt whatever to provide collection and delivery services to those towns and villages. In the case of a very large number of the goods stations which they did provide, the total tonnage of general merchandise to be handled was exceedingly small and, coming as it did from so many different directions, even a comparatively low average wagon-load could only be obtained by staging of the traffic from one railway station to another, and by numerous transhipments. This method of working also involved a multiplication of cartage facilities, and finally it involved much unnecessary shunting and marshalling of wagons *en route*.

" With the advent of the motor vehicle, with a much greater effective range, and a greater carrying capacity, the factor which should determine the layout of a railway system is the same as that which dominated the layout in the past, namely the cartage element, the only difference being that just as the economic range of the cartage factor has so enormously increased, the cartage services should be designed to cover much wider areas, and the wayside stations and branch lines, with their separate establishments for railway and road purposes, should be eliminated.

" It is my view, after many years' study of this particular problem, that whether the railway companies themselves set about this complete re-organisation of their operating economy, or whether it is to be done by a National Transport Board, there can be no doubt whatever that the transport system of the country as a whole can be put upon a highly satisfactory basis both as to service and as to cost. With a carefully worked out reorganisation of railway services, giving to the road vehicle its proper place in the railway economy, the savings to be effected would be so enormous as to provide the necessary servicing even of the present large railway capital, and at the same time to reduce the charges to the public. . . ."

While it is true that the Leeds paper was delivered during the " square deal " campaign, and while I then took the opportunity to relate my particular ideas to that campaign, the Paper itself was the last of a serious of six designed before the " square deal " was formulated, in which I surveyed the

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transport situation as a whole, and the proposals themselves were only a crystallisation of the attempts I have made over a number of years to obtain consideration of my theories. I did advance them indeed when I was in the service of the Great Western Railway, in a report upon Branch Line Working which I made in December, 1928. Historically, however, they go back very much further than that; indeed, to the days when I commenced my railway career in the Goods Train Running Office of the Superintendent of the Line at Paddington, namely, back to the year 1906.

In those days, while I was learning my trade, with some of the ablest and most far-sighted operating officers in the country (in particular my old chief Mr. Charles Aldington), I was impressed with three factors which appeared to me to lie at the very root of railway operating, namely the low average payload (*a*) per wagon and (*b*) per train, and the very low average speed of movement of goods trains. In the intervening years I have never failed, either inside the railway service or outside, to keep these factors in mind, with the result that, with an intimate knowledge of station and train operating from within the railway service, and a similar knowledge of the actual movement of goods from the traders' point of view, I am not only absolutely convinced that the methods I advocate for the reorganisation of railway operation are sound, but have proved from actual experience in the reorganisation of the movement of goods that they are practicable, for the principles I advocate have actually been put into operation on a large scale by industrial undertakings. This has been possible either by the sole use of road transport, or by the combined use of railway and road transport, or of coastwise shipping and road transport. From the time I entered commercial life from the railways, I concentrated upon the elimination of waste movement, the improvement of vehicle loading and the speeding up of movement in such a way as to obtain the full use of vehicles, and of the power units.

The reason I always emphasise the necessity for closing branch lines and small stations is that I believe that railway operating policy is still dominated by the existence of these units, not because I am one of those who believe that there is any virtue in writing down railway capital. I am quite certain that the solution of the whole problem lies in the reduction of operating (out-of-pocket) expenditure, and that with the proper use of the road vehicle in combination with railway, canal and coastal services, the payload of wagon and of train, and of ship and of barge, can be very substantially increased, and the speed of freight train movement improved enormously, thus giving to the unit of power, the engine, and the unit of carriage, the wagon, much more intensive payload employment. In addition, the handling of the goods themselves and the extensive shunting and marshalling operations, which present methods of operation make inevitable, can be reduced to very much smaller proportions. As you say in these days it is necessary to avoid large concentrations of either goods or passengers, but I am satisfied that concentrations would not be increased under my proposals—rather the contrary. Certainly the heavy concentrations in shunting and marshalling yards would be very substantially reduced.

Criticism that I have had from other quarters is directed to the view that my proposals would involve an increased use of road transport, and consequently of petrol. I do not accept this view. They would be directed just as much to the elimination of waste in road transport operations as in railway operations. One result would be the elimination of numerous collection and delivery services, often overlapped by country lorry and railhead services, and certainly overlapped by hauliers.

It has been rather surprising that, despite the fact that my views have obtained wide publicity, and that I have staked my claims of savings rather high (and I would now put them higher) there has been virtually no criticism from the railways. On the contrary, I have found that, in informal discussions with railway officers of all ranks, they are fully in sympathy but feel perhaps that they cannot go quite as fast as I would like to go.

It has been said recently that such reforms cannot be carried out in time of war. On the contrary, I think they will be forced upon us during the War, and that indeed they offer the only solution to the formidable problems created by the shortage of railway wagons and sheets, particularly in a winter like the last. Many of the difficulties then experienced would have been avoided had it been possible to secure the better loading of the railway wagons available, and the speeding up of the movement of the freight trains.

Yours faithfully,

FREDERICK SMITH

(*See editorial article on page* 347)

The Railway Train of 2040

11, Kilburn Priory, N.W.6

September 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Whether the trains of 2040 referred to in your editorial notes last week will run on lines or whether they will be aerial expresses with slip coaches which glide to earth, and whether tabloid feeding will have brought about the disappearance of restaurant cars, make interesting items of speculation, but the future of railways, as of much else in this country, will be affected by the population, which will shortly begin to decline, then gradually change in compostion, so that it contains many more elderly people and far fewer young people than at present, and, according to some sociologists, may in a hundred years' time have so decreased as to be equal only to the population of London today.

With more elderly people and fewer young people we may perhaps anticipate an increase in the demand for first class travel and fewer applications for half-rate season tickets; more travel to Bath and less to the Lake District, and a decline in the forwardings of perambulators and bicycles, but applications for exceptional rates for bath chairs and hot-water bottles. Later, if the population gets much smaller and trains continue to run on the ground, stations may be closed owing to towns being depopulated; trains may be fewer and smaller, and engines less powerful; some double tracks may be converted to single; block sections may be fewer, and platforms shortened in length, whilst many may be the attempts to find alternative use for the sidings, sheds, and waiting rooms that become superfluous.

There may be changes in the travel habits of people which will result in these conclusions being hopelessly wrong, but that there will be changes in this country's population during the coming years we may be certain, and it is, perhaps, not outside the bounds of speculation to suggest that in a future "square deal" campaign we may see the railways advocating family allowances.

Yours etc.,

ALUN WILLIAMS

Whitby & Pickering Railway

Essex House, W.C.2

September 25

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The following is an extract from a report (in the *Railway Register*, Vol. I, p. 67) of the meeting of the York & North Midland Railway Company held at York on Monday, October 28, 1844, for the purpose, among other things, of approving the agreement to purchase the Whitby & Pickering Railway which was incorporated on May 6, 1833, and opened on May 26, 1836. George Hudson, the Chairman, said:—

"The Whitby and Pickering line I have purchased at the sum of £80,000, the original cost having been £130,000. It was the sum they asked, I did not attempt to run a hard bargain with them—£80,000 was the sum I fixed in my own mind, and I paid it. I believe that Whitby will become as flourishing a place as any in England, and that it will become a place of resort as a watering place. The grounds round Whitby are beautiful beyond description. There will be some further expenditure required to put the railway into good condition, and when that is done, I hope some day to have an excursion with the proprietors, to look at one of the most romantic and beautiful things that exists in the railway world. It runs down the valley of Pickering and nothing can exceed its beauty. I am only astonished how a railway was ever got through the country."

Yours faithfully,

KENNETH BROWN

THE SCRAP HEAP

WHAT THE GERMANS BROADCAST

From Zeesen a broadcast given in Arabic on September 18 stated that " A Swedish correspondent reports that poor people in Britain are forced to pay 3s. 4d. for shelter in the Underground." It is suggested that the odd 4d. is for Entertainment Tax.

* * *

Petain, a station on the main line of the Canadian Pacific Railway 87 miles east of Vancouver, is to have its name changed to Odlum. It was originally named in 1918 after the defender of Verdun, but will now perpetuate the fame of Major-General Victor W. Odlum, Commander of the Second Canadian division in England.

The town of Swastika, Ontario, has voted to retain its name as it was called thus before the swastika was associated with Nazism.

* * *

SIGNAL BOX TIPS

In the signal box at Harrogate station is a handsome Bible which was presented to the cabin by the British & Foreign Bible Society on January 1, 1880. This New Year's gift seems to indicate some anxiety as to the moral welfare of the railwaymen of the day, and perhaps with reason, for in the book of instructions preserved in the same cabin is the following entry for June, 1875 :—

IMPROPER USE OF TELEGRAPH

" It having come to my knowledge that on the occasion of races, etc., stations are often called up for the purpose of being asked whether they can name the winner, I have to inform all concerned that in the future whenever such a thing is done, the sender will be required to pay the rate for a postal telegraph, which will in no case be less than one shilling."

—*From the " Yorkshire Post."*

* * *

" There were too many young men in the London tubes again last night who might be doing A.R.P., A.F.S., or other useful work for their country. I travelled from Strand station to Hampstead. Hundreds of young men of military age were on platforms, in the subways and on the staircases, braving the stifling atmosphere—and making it more stifling. One man who curtly announced that he was a pacifist threatened to punch me on the nose because I asked him why he was there. He did not carry out his threat."—*From the " Daily Express."*

* * *

Tim Callahan was working for a railroad. The Superintendent told him to go along the line looking for washouts. " And don't be so long-winded in your next report as you have been in the past," said the Superintendent. " Just report the condition of the roadbed as you find it, and don't use up a lot of needless words that are not to the point. Write a business letter, not a love letter." Tim proceeded on his tour of inspection, and when he reached the river, he wrote this report of the Superintendent : " Sir : Where the railroad was, the river is."

A doctor who was keenly interested in locomotives was being shown round the erecting shop of a large railway works where a considerable number of engines could be seen undergoing repairs. Said he jokingly, " You have quite a lot of patients undergoing treatment here it would seem. Reminds me that I myself have more than usual just now awaiting repairs." "Yes," replied the shop foreman, " but most of *your* patients can tell you something about what's gone wrong with them ; ours are *all* deaf and dumb."

* * *

In order to give Swedish airmen practical training, a disused 19-mile stretch of railway in Sweden, extending from Vimmerby to Ygre in the Västervik region, is to be bombed by the Swedish Air Force. This line was closed about a year ago and was due to be dismantled until the present decision was taken.

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OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

BRAZIL

Paulista Railway in 1939

According to the annual report of the Paulista Railway another good year was registered in 1939. Receipts totalled 140,314 contos compared with 140,475 in 1938, and expenses amounted to 89,890 contos compared with 90,027. Though the net balance of 50,424 contos was thus slightly less than that of the previous year, the working ratio was still extremely good. After adding to this balance the sum of 16,195 contos brought forward from 1938, the total surplus of 66,618 contos was divided as follows: 40,301 contos paid in dividends, the rate thus being 9 per cent.; contribution to Pension Fund, 2,642 contos; interest on external debt, 2,720 contos; Reserve Fund, 2,973 contos; and Forest Services Fund, 3,718 contos; leaving a balance of 14,264 contos to be carried forward to 1940.

Traffics, Foreign Debt and Other Expenditure

The principal traffics compared with those in 1938 were as follow:—

	1938	1939
Passengers	5,819,410	6,135,831*
Animals	529,501	616,163
Parcels—tons...	94,535	103,118
Coffee—tons	719,682	486,017
Other goods—tons	2,643,143	2,739,997
Ton-km.	734,069,582	740,915,075

* In addition, 70,778 immigrants with baggage were carried free during the year, making a total of 1,418,087 so carried in the last 57 years.

The company's foreign debt stood at $2,513,500 (dollars), all that remained of the 4,000,000 debt contracted in the U.S.A. in 1922, and, with the exception of that due in March, interest payments were up to date. Despite restrictions on exchange, authority had already been obtained for this remittance. The fund for the amortisation of the external debt now stood at 111,125 contos. The Improvements and Traffic Expansion Fund totalled 25,200 contos, and the Reserve Fund amounted to 13,154 contos or some 2,972 contos better than the total for 1938 as a result of interest on investment.

In accordance with Decree No. 4,202 of March 10, 1927, a surcharge of 10 per cent. had been charged on all tariffs in force for the purpose of increasing, improving, and renovating installations and rolling stock, and amounts credited to this fund up to December 31, 1939, totalled 125,543 contos, which sum had already been overdrawn to the extent of 6,756 contos. With the total of 3,718 contos credited to the Forest Services Fund this now reached 15,917 contos and corresponded exactly to the amount so far expended.

Capital and Route Mileage

The capital at charge was shown to be 488,020 contos on December 31, 1939, and calls were made in March and September for the payment of the third and fourth instalments, respectively, of 15 per cent. of the 1937 share capital issue. The total route-length of the system remained unaltered at 1,511 km., of which 44 km. were double track.

Construction and Open Line Works

Work on the Agudos extension proceeded normally and earthwork was almost completed. The total track length of permanent way laid during the year was 13·72 km. excluding 1·34 km. of sidings, and a total of 29·16 km. of telegraph line was erected. The section from Pompéa to Quintana was opened for traffic on April 1. Earthwork necessary for the widening of the gauge from 1 m. to 5 ft. 3 in. between Ityrapina and Pederneiras continued, and the reinforced concrete bridge over the river Tieté was finished in June, 1939.

Electrification

Continuing with the programme to extend the electrification to the broad (1·60 m. or 5 ft. 3 in.) gauge lines, the traffic density of which has for some time made such a measure necessary, work was begun between Ityrapina and Dous Corregos, on the Ityrapina—Jahú line, over a distance of 78 km. (48·5 miles). This section is at present metre gauge but is to be widened. The remainder of this line, namely from Dous Corregos to Jahú, a distance of 32·9 km. (20·5 miles) is still under construction. Four new 4,000 h.p. 2-Co + Co-2 type electric locomotives were acquired from the American G.E.C.

Rolling Stock

During the year, 17 cage wagons and 14 baggage-brake vans were reconstructed, and 10 new passenger coaches were put in hand. The erection of 250 steel wagons purchased abroad in 1938 and also of 150 fruit wagons was completed, and a further 250 steel open wagons were constructed out of parts purchased abroad.

INDIA

Monsoon Havoc

The early break of the rains this year has brought in its wake the usual crop of railway accidents. Ordinarily, Southern India does not suffer much from the monsoon at this time of the year. But there occurred several accidents in these parts since the burst of the monsoon about the end of May last. Five persons were killed and over 60 injured when the South Indian Railway Dhanushkodi passenger train from Madras was struck by a terrific cyclone between Panchalam and Tindivanam stations, about 75 miles from Madras. The cyclone threw most of the carriages off the rails, only the three rearmost remaining on the track. Passengers had to be rescued from the carriage windows. Heavy rains caused severe floods which damaged many railway bridges in South India. The collapse of one near Maharpur Road station, on the M. & S.M.R., under a relief train, left the engine suspended. It is astonishing that there was not a single casualty in this accident. About 30 miles from Ajmer on the B.B. & C.I.R., a goods train was almost wholly derailed. On the Bengal-Nagpur Railway, heavy rainfall caused high floods in the Baitarini and Burabolong rivers, and several breaches occurred in the railway line between Bhadrak and Jajpur Road stations, about 183 miles from Howrah. Transhipment was found to be impossible and through services had to be temporarily suspended. The Puri express between Howrah and Puri had to be cancelled and the up and down Madras mails were diverted to the Raipur-Vizianagram route. Through running is expected to be resumed by July 7.

Rolling Stock Programme for 1941-42

The rolling stock programme of the Indian railways for 1941-42 was placed before the Standing Finance Committee. The programme is estimated at Rs. 3,93,24,000 (nearly £3 millions) of which a sum of Rs. 86·82 lakhs is to be spent on capital account and the balance from the Depreciation Fund.

The programme includes provision for 41 locomotives, of which 17 are on replacement account; 117 boilers, almost wholly on replacement account; 268 bogie and 20 four-wheel carriages of which all except two four-wheelers represent replacements. Provision is made for 1,550 broad-gauge general service wagons and 75 metre-gauge general service wagons, all on replacement account. In addition, it is proposed to obtain 131 tank wagons—for the transport of petrol, kerosene oil, vegetable oil, and liquid fuel—185 miscellaneous tank wagons and 5 cranes. A large number of the tank wagons will represent additions to the stock.

UNITED STATES

New Chicago—Florida Streamline Train

A new streamline coach train is being built for the Illinois Central System to run between Chicago and Miami, Florida. Delivery is expected about December 1. It will consist of lightweight coaches, a dining car and a tavern - lounge - observation car; there will be seating accommodation for 254 passengers. Interior decoration will be such as to suggest semi-tropical Florida.

The Illinois Central System will operate this train jointly with other railroads concerned, so that there will be a daily streamline service to Florida from Chicago. Similar service will be provided on alternate days over three routes, originating with the Pennsylvania, the Chicago & Eastern Illinois and the Illinois Central. The over-all time to Miami will be 29½ hr.

ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Finance of Bus Operators

THE success with which country bus operators have overcome difficulties arising from the war and the necessary readjustment of their services, has directed the attention of investors to the attractions of the shares of the chief of these undertakings. *The Financial Times* records that the issues of the members of the Tilling-B.E.T. groups have been in renewed demand as a result of the satisfactory results recently announced by a number of the operating companies. In the early days of the war it was feared in some quarters that the abnormal conditions which were developing, and especially the rationing of petrol, would sadly handicap the operations of this nation-wide transport system. In fact, although the services have frequently had to be curtailed, there have evidently been compensatory economies, and the average loading of the buses has been higher. Tilling & British Automobile Traction by itself or in association with one or other of the main-line railway companies controls over a score of motor services, with names ranging the alphabet from Aldershot & District to Yorkshire Traction. The former recently reported a net profit of £51,750, which compared with only £35,800 for the previous year, and it raised its dividend from 8 per cent. to 10 per cent. The Maidstone & District and the Southdown have declared interim dividends of 5 per cent. which are the same as twelve months earlier, and this is taken as a favourable pointer to the distributions for the whole year. The B.E.T. and Thomas Tilling own approximately 90 per cent. of the issued capital of Tilling & British Automobile Traction and therefore dealings in the ordinary shares of the last-named are infrequent. The interim dividend for 1940 was reduced to 3½ per cent. from 4 per cent. tax free, but the reason for the lower return was the increase in the rate of income tax. Thomas Tilling £1 stock units received their usual 5 per cent. interim dividend and it is believed probable that the final will also be at a similar rate again. B.E.T. deferred are quoted in £100 of stock, and the price of around 580 is a little forbidding to the average investor who does not always appreciate that he can equally well buy £10 nominal for, say, £58, as the round £100 stock for £580. For the year to March last the cash dividend was 45 per cent. and at the meeting the Chairman gave a broad hint that, all going well, stockholders might hope for a similar total for the current financial year. It will be seen therefore that efficiently-managed bus companies are so far weathering the war very reasonably well.

New Zealand Government Railways Road Services

THE report of the New Zealand Government Railways for the year ended March 31, 1940, shows that the co-ordination of passenger road and rail services, begun in a small way fourteen years ago, is reaching a point of stability, with the almost complete cessation of competitive running on parallel routes between principal centres. The department has recently purchased the plant of the Rotorua Motor Transport Company, and has taken over its Rotorua—Opotiki and Rotorua—Wairakei routes, as well as the local sightseeing services previously operated by that company. This purchase completes the department's passenger connections with railheads serving the important Rotorua tourist area and eliminates some local competition. Road goods-traffic operations of the department have been further extended during the year by the purchase of services operating on the following long-distance routes: between Auckland and Morrinsville; Wellington and Martinborough; Christchurch and Nelson; Christchurch and Kaikoura; Christchurch and Timaru; Timaru, Waimate, and Oamaru; and Dunedin—Oamaru—Kurow, and Hakataramea. The effect has been to make possible better co-ordination and interlocking of goods services as between road and rail in those areas. Revenue from passengers in the year 1939-40 was £304,925; from goods, parcels, mails, etc., £205,976; and from miscellaneous £1,857, making a total of £512,758, and leaving an operating profit, after providing for expenses and depreciation, of £21,845. Interest charges were £12,585, leaving a net profit of £9,260.

The Buenos Aires Transport Problem

THE unsatisfactory financial situation of the City of Buenos Aires Transport Corporation, as shown by the heavy deficit on the first year's working, was discussed in the Argentine Chamber of Deputies on June 26, when a Socialist motion, calling on the Municipal Legislation Committee to study the Urban Transport Co-ordination Law and propose such amendments as might be deemed necessary, was approved after a heated debate. In stating the case for the corporation, the Minister of the Interior, Dr. Taboada, pointed out that, although the first year's accounts showed a loss of some 9,000,000 pesos, the present difficult position of the corporation was due to the uncertainty arising out of the war, but negatived the suggestion that any amendment of the existing law was necessary. The Government was, however, prepared to come to the aid of the corporation to enable it to fulfil its obligations, and if for any reason this was found to be impossible, the whole question would be submitted to Congress for its consideration. But this statement did not satisfy the Socialist opposition, which maintained that the corporation, as at present constituted, was a liability to the city rather than an asset; that the services were inefficient; and that financially it was in a condition verging on bankruptcy. One of the speakers stated that, if all the obligations were included in the balance sheet, it would show a deficit of some 60,000,000 pesos. The difficulties of the corporation are complicated by the fact that the Statutes provide for the payment of a dividend of 7 per cent. on a capital which at present amounts to 570,000,000 pesos. In other words, on the present showing, the dividend service necessarily absorbs 80 per cent. of the gross receipts. Due, however, to the ambiguous working of the text in the original draft of the Law, some doubt exists as to whether the corporation's dividend obligations, as set forth in the Statutes, provide for the payment of a flat, irreducible 7 per cent., or *up to* that rate.

According to reports we have received from our Argentine correspondent, the public as a whole has not gained up to now by the corporation's control of the city's passenger transport services. On the contrary, both the dilapidated state of many of the surface vehicles and their irregular running are a frequent and just cause of complaint. Probably the best service is that given by the privately-owned *colectivo* lines, which at present are independent of the corporation. As at present constituted and organised, the latter is not in the position to provide the city with the transport service which its importance merits, and complete reconstruction would appear to be the only remedy. The view is widely held that one essential feature of any scheme of reorganisation aiming at placing the corporation on a sound financial basis is a readjustment of the tramway and bus fares on a distance basis instead of the existing uniform rate of 10 cents; but this is a change to which the vast majority of the City Councillors have always been strongly opposed. In this connection, it is interesting to note that the *Municipal Statistical Review* contains some data regarding passenger transport in the City of Buenos Aires during the first quarter of the current year. According to the figures given, the number of urban passengers shows a downward tendency, and this has affected the gross

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receipts, the comparative figures for the first three months of 1939 and 1940, respectively, being as under :—

	1940 $ Paper	1939 $ Paper
Gross receipts	32,252,553	32,701,346
Passengers carried	297,568,739	302,359,945

The month of February this year alone showed a slight increase, due probably to the fact that 1940 is a Leap Year. February last was also notable for the fact that during that month the number of passengers conveyed by the *colectivos* was 2,900,000 more than those carried by the tramways, and 1,900,000 more than by the buses. In 1939 the number of passengers conveyed by the *colectivos* was approximately the same as that by the tramways, but both fell short of the total for the buses. The following are the figures for the passengers carried during the entire year :—Tramways 364,733,057, Underground 120,697,541, buses 390,102,007, *Colectivos* 365,968,431. The following comparative figures show the number of passengers carried by each of the transport systems during the first three months of 1940 and 1939, respectively :—

	1940	1939
Tramways	88,561,377	89,504,870
Underground	25,919,898	27,131,026
Buses	91,032,116	96,298,277
Colectivos	92,115,348	89,425,772

As the actual number of passengers travelling by the *colectivos* cannot be determined with any accuracy, the figures relating to these vehicles must be regarded as only approximate. Proposals have recently been laid before the Buenos Aires Transport Corporation for replacing the trams in the centre of the city by trolleybuses, the greater ease in handling of which, it is contended, would make them more suitable than tramcars for operation in the congested zones. It is also reported that the Ministry of Finance is considering a project to finance expropriation proceedings by the transport corporation against the bus and *colectivo* owners.

The Dublin & Lucan Tramway

AN announcement made in Dublin on July 10 that the rails of the Dublin & Lucan Tramway had been acquired, through the Hammond Metal Company, by the Great Southern Railways Company, seems to mark the end of the somewhat chequered career of this undertaking. It is understood that the G.S.R. has taken over the rails in order to make railway replacements for which new materials are now unprocurable owing to the drastic restrictions of steel supplies, and removal of the Lucan rails began immediately the arrangement was concluded. The undertaking was incorporated by Order in Council in 1880 as the Dublin & Lucan Steam Tramway Company and the two miles from Parkgate Street, Dublin, to Chapelizod was opened in 1882. The through line to Lucan, 7 miles of 3-ft. gauge single line, was brought into service on February 17, 1883. It was worked by 6 four-coupled enclosed Kitson steam engines, 9 passenger carriages, and 16 goods wagons. From 1889 to 1896 a 1⅞-mile extension from Lucan to Leixlip, owned by a separate company, was in operation. It was re-opened in 1897 by a local engineer, but finally closed in 1898 and the track removed. Under powers of an Order in Council of 1897, the Dublin—Lucan line was electrified, on the overhead trolley system, by Dick, Kerr & Co., and was opened on March 8, 1900. Included in the work was the conversion of the gauge to 3 ft. 6 in. from the original 3 ft. The track, which ran mainly alongside the public road, was laid with 50-lb. rails, and was still single, with six passing places ; a speed limit of 10 m.p.h. was imposed over the whole line. The maximum gradient was 1 in 21 and the radius of the sharpest curve 27 ft. In 1900, also, the name of the company was changed to the Dublin & Lucan Electric Railway Company. The electric rolling stock consisted of 8 motor cars, 1 electric locomotive, 4 open and 2 closed trailer cars, 14 open wagons, 1 timber truck, and 5 parcels vans. The line terminated at Parkgate Street, Phœnix Park, away from the centre of Dublin, and, although the city trams ran to the same point, the difference in gauge precluded through running. By reason of increased post-war working expenses, the undertaking was closed on January 29, 1925, but in December of the same year, arrangements were concluded for the Dublin United Tramways Co. (1896) Ltd., to take over the line, and convert it to the 5 ft. 3 in. gauge, to accord with the other D.U.T. lines and to enable through running. The work was carried out under powers secured in 1927, and, for higher-speed service than the ordinary city trams, 7 special 68-seat double-deck cars with B.T.H. electrical gear were built at the Inchicore works of the D.U.T. From May 14, 1928, cars ran as far as Chapelizod, and at the end of that month the full service was in operation between O'Connell Bridge, Dublin, and Lucan—a distance of 8¼ miles. With the gradual abandonment of trams in Dublin, the Lucan line was finally closed on April 13, 1940.

Proposed Irish East Coast Road

THE Wicklow County Council is proposing to acquire land compulsorily at Dunbur, Kilpoole, and Magherymore, for the purpose of building a new link coastal road to connect with Brittas Bay county road and on to Arklow. At the public inquiry recently it was stated that the project for this coastal road was first formed in 1848, when the relief works after the famine were being undertaken. At that time about 900 yd. of road foundation were laid at Dunbur but the work was abandoned and has remained unfinished ever since. In 1926 the Arklow Urban Council began an agitation for this coastal road and was supported by Wicklow Urban District Council, and also by the demands of the residents at the southern end (Sallymount-Ardinary), where there was once a road but there is now no connection. At present opposition to the scheme is forthcoming from land-owning interests on the grounds of destruction of amenities. This road, if built, will form an important coastal link for tourist trade and, in certain circumstances, of strategic value.

Boosters for Commercial Road Vehicles

AMONG the factors which tend to militate against the even flow of general highway traffic is the inability of heavy freight vehicles to maintain their speed on up grades. A common sight on every main road running through undulating country even where the hills to be climbed, although often long, are not steep, is a procession of vehicles following in the wake of heavily laden lorries crawling up a gradient at 4 or 5 m.p.h. The result is loss of time, traffic congestion, and sometimes risk of accident caused by the attempts of drivers in the rear to overtake in circumstances that make anything of the sort extremely hazardous. Considerable attention has of late been given to this problem in the U.S.A., where, it is estimated, there are over four million commercial motor vehicles in service, and as a means of enabling such vehicles to climb hills at increased speeds, more nearly approximating to those attained on the level, there is being introduced what is known as the Clark booster, a device by means of which the power output is augmented by bringing into use temporarily as required a 45 h.p. auxiliary engine which in normal running conditions remains out of action. The principle is the same as that of the booster sometimes fitted to railway locomotives to assist at starting and when climbing long grades with heavy trains. Although extensively used on railways in the United States for years past, its application to road conditions is quite recent. The action of the Clark booster is wholly automatic and independent of the driver of the vehicle. It comes into operation when greater power is needed for a gradient and cuts out again automatically when the hill has been surmounted. It thus enables an even cruising speed to be maintained, eliminates frequent gear changes in undulating country and considerably shortens the time taken for the trip. The speed in r.p.m. of the main engine for considerable periods is reduced, which represents a saving in wear and tear, and another claim advanced is the consequent increased availability of the driver and the motor vehicle. The 45 h.p. auxiliary engine is attached at the rear of the main engine. Its short propeller shaft runs forward through a pair of universal joints to the transmission where the connection is made through an over-running clutch. Results have shown that with the booster added a motor vehicle can perform from 55 to 60 per cent. better in high gear on grades. The auxiliary engine comes into operation on all gears except the lowest, but its main function is that of maintaining speed in top gear when a gradient is encountered.

Producer-Gas Vehicle Operation

Continuation from page 68 of the July 19 issue of an article based on the experiences of lorry and public-service vehicle operators

By BRIAN REED

THE great outstanding problem to be solved in the operation of producer-gas vehicles is that of filtering the gas efficiently. Hitherto the modicum of success, or entire unsuccess, of this process has led to untold trouble, and if it could be solved it is not unlikely that the producer-gas vehicle would become as reliable as a petrol or a diesel vehicle, and would show maintenance costs just as low. The very latest filters appear to give a performance within measurable distance of what can be regarded as a completely satisfactory standard, but that is not to say that a long road has not to be travelled before every producer-gas bus or lorry has proper filtering equipment. And it should be emphasised that some of the troubles with existing ordinary filters have been due to neglect of simple precautions.

Cylinder Wear

At present the rapid rate of cylinder wear due to imperfect filtering of the cooled gas very often more than offsets any gain in fuel charges. Whether the high wear is due to abrasion, corrosion, or a combination of the two, does not seem clear, but the lack of that scoring which one might expect from the presence of solid fuel particles in the cylinders contributes to a belief in the corrosion theory, particularly as certain sulphur compounds are known to exist in anthracite fuels and are not eliminated by the filters. Moreover, the wear of the liner is mainly at the top and is even, and the wear of the piston round the top land and top groove is much the same as in petrol and oil engines. If the corrosion theory applies to any great extent, a solution of the filtering problem will not eliminate extra cylinder wear, although it may reduce it.

Naturally the amount of grit carried through any filter will vary with the particular brand of fuel used, and certain fuels which give good gas and good performance in the producer are by no means the best from the filter and engine viewpoints. Moreover, the type of filter must be suited to the fuel.

Filters in Relation to Engine Size

Although the Hartley Committee recognised the major importance of filtering, it was content with a comparatively simple design of filter, known as the H type, containing sisal tow, and claimed to have had consistently good results from this pattern. But it is important to realise that the Hartley Committee was dealing almost entirely with engines of four litres or less. The velocity of the gas through the filtering system is probably the greatest single factor in determining the amount of dirt or solid matter admitted to the engine cylinder, and above the 4-litre capacity it becomes progressively more difficult to provide a filter area commensurate with the increased piston-swept volume and the increased draught. Hence, filters and layouts suitable for Bedfords and similar vehicles are of no use whatever for 6 to 10-litre engines, in which the velocity of the gas through the biggest filter which can be provided conveniently is incomparably higher.

Nor must it be forgotten that although it may be possible to get a very high filtration efficiency, in the interests of volumetric efficiency and engine power this must not entail a high resistance to the gas flow. Particles of fuel as large as three microns or over can be extracted fairly easily and a free gas flow still be maintained, but the extraction of one to one-and-a-half micron particles is anything but simple, and it is just these sizes which can cause a great deal of wear, even to the order of 150 miles per 0·001 in. of cylinder barrel wear.

Fabric and Fibrous Filters

A feature of the normal types of fabric and fibrous filter has been the rapidity with which they clog up, and for reasonable results it seems essential to adopt a system of preventive maintenance, in which the filtering medium is inspected and cleaned at least once a day. Incidentally, this helps to eliminate one of the main disadvantages of a fabric filter, namely, an almost instantaneous blow-through when the filter is becoming choked and the back pressure is high, resulting in severe scoring or wear of the pistons and liners within the space of 10 min. or less.

A good deal of trouble has resulted from the fabric candle type of filter brought into use in this country principally in conjunction with the Gohin-Poulenc producer. Such filters gave adequate results with producers burning charcoal, for which they were originally designed, but the performance has been poor with anthracite fuels, mainly because of moisture clogging up the filtering elements. Furthermore, if the gas has not been cooled adequately before reaching the filter, the fabric may char, and in any case the elements need careful handling and frequent cleaning. Both fabric and fibrous filters seem to need some control over the gas temperature to give a continuously good performance.

Filter Efficiency

Experiments made by the Tilling group of companies, principally by the Bristol Tramways & Carriage Co. Ltd., showed that large and small filters have different time-efficiency curves, large filters rising to maximum efficiency (that is, passing least dust) more slowly than smaller-diameter equipments, which quickly rise to maximum efficiency and then just as quickly fall off. By placing small and large filters in series it is possible always to have a fairly good efficiency, the second filter picking up dust passed by the first, and minimising the risk of any disastrous blow-by. This reasoning gave rise to the milk-churn filter layout, comprising a large vertical filter surmounted by a small unit, which has superseded the original H-type vertical filter containing sisal tow, as used in the first Ministry of Mines producers.

War development work had not proceeded very far before there was forced to the notice of operators of medium and large engines that something much more efficacious than the then normal patterns of fabric, oiled-coke, or fibrous filters was essential if the vehicle was to make any worth-while mileage. Numerous experiments were made with filters in series, such as the milk-churn; with oiled-coke and sisal filters in series, sisal and fabric filters, oiled-coke and wire wool in oil, and steel turnings in conjunction with double cloth bags, but without the desirable degree of success. As a result of experience with the original simple filter, the Brush-Koela plants now incorporate a double-stage filter comprising a perforated steel plate and wire wool in the first stage and wire wool above washing soda solution and oil in a twin second stage.

Water Washing Filters

Promising developments have resulted from experiments carried out by the Tilling group of companies to provide for continuous washing of the gas, and a non-centrifugal water filter has been evolved at the Chelmsford depot of the Eastern National Omnibus Co. Ltd. under the direction of Mr. C. H. S. Pickett, the General Manager, and Mr. W. Morison, the Chief Engineer. This filter, which has been the subject of extended experiments, consists in its final form essentially of a box in which the gas is led into a central sump, thus overcoming variation in the head of water on a gradient. After passing through a number of $\frac{1}{8}$-in. holes, spread well apart to prevent the bubbles from coalescing, the gas passes along the underside of other perforated plates, thus being given a long path in contact with water without any addition to the head or back pressure. The gas is then led past a number of baffle surfaces to ensure that it is well agitated

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with the water entrained by it, and is carried towards the upper part of the filter, where the greater portion of the water separates out and returns to the bottom of the tank.

Tests with this filter showed that the gas was being sufficiently washed to remove practically all the dust and the whole of the chemical impurities, but that water was being carried over into the engine. As this water contained dirt and chemicals, wear of the cylinder bores was still in evidence, and some form of separator was seen to be needed to prevent this carryover of water. The gas was therefore passed through a centrifugal separator, in which the whirling motion imparted to it, and the sudden change of direction, caused the suspended water to be thrown out of the gas and to fall to the bottom of the separator. Examination of the cylinder bores further showed that it would be advisable to provide some form of upper cylinder lubrication, and a simple drip-feed lubricator, using ordinary engine oil, was accordingly incorporated in the plant. This system of filtration has proved very successful, and after approximately 12,000 miles in operation the cylinder wear of certain vehicles has been found to be in the neighbourhood of 0·001 in. per 3,780 miles.

The Wichert Type of Bridge Span

By means of a rhomboidal hinged panel over each intermediate pier, the advantages of continuous girders are obtained without increasing the stresses even if a pier settles

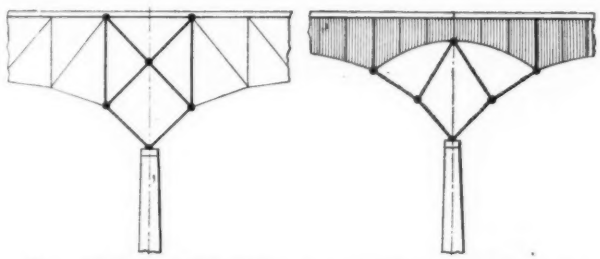
SOME seven or eight years ago Mr. R. E. Wichert of Pittsburgh, U.S.A., invented a new form of bridge girder truss, now known as the Wichert truss or span. The notable features of the design are that it combines the advantages of the continuous girder with a structure that is statically determinate and yet provides for safety against pier settlement. When properly designed, spans of this type are thoroughly stable and more economical than the ordinary span, and have the added advantage of being much simpler to erect than the conventional type of girder span; economy in substructure is also secured, and the certainty of reactions and elimination of reaction adjustments are all in favour of the design.

The design consists essentially of pinned rhomboidal panels over the intermediate piers, and the base of each panel usually rests upon a rocker-type bearing. This hinged rhomboid frame obviates any increase in girder stresses due either to movement of the rocker bearing as a result of pier settlement, or to differences in temperature in the top or bottom chords. Also, since the structure is statically determinate, the stresses can be more quickly and accurately calculated, than with a conventional continuous span.

The Wichert theory may be adapted for use either with the through or deck pattern truss span, with the steel arch, or with the plate girder type of span in its various forms. Two typical applications of it are shown in the diagram below.

Though little known in this country, the Wichert span is being increasingly used in America, and one of the latest examples of it is to be found in the new $1,000,000 Potomac river bridge at Hancock, Maryland. It is the subject of an illustrated article in the June 6 issue of our American contemporary *Engineering News-Record*. This bridge consists of the following sections from north to south: (1) a four-span Wichert continuous plate girder section, having 130-ft. end spans and 160-ft. intermediate spans; (2) an embankment 388 ft. in length; (3) seven simple rolled steel beam spans, in all 308 ft. long; (4) a five-span Wichert continuous plate girder unit, having 100-ft. end and 140-ft. intermediate spans; (5) a six-span Wichert continuous truss section over the river, the end spans being 117 ft. 9 in. and intermediate spans 196 ft. 3 in. long, and (6) another five-span Wichert continuous plate girder unit, with 100-ft. end and 140-ft. intermediate spans. The total opening is thus approximately 3,140 ft. in aggregate length, and two varieties of Wichert span are used. Their use has effected a substantial saving in steelwork and in masonry in the piers, which are not so high as if conventional types of girder were used; only between the different continuous girder sections are full-height piers necessary. The depths of the 100-ft. and 140-ft. plate girders in sections (4) and (6) are 20 ft. over the piers and 5 ft. 6 in. at centres of spans; those of the 130-ft. and 160-ft. spans in section (1) are 20 ft. over the piers and 6 ft. 6 in. at centres of spans. The main river truss spans measure 11 ft. at the centres and 30 ft. 6 in. over the piers.

Girder erection was begun at the south end, section (6), the southernmost 140-ft. span of which crosses the Baltimore & Ohio Railroad. This span was raised bodily in one piece by locomotive cranes of this railway and placed on temporary single-bent trestles erected on the piers until the rhomboid members could be fitted into place to take the load. A travelling crane was then placed on the completed span for the erection of the remaining spans in section (6)



Diagrammatic illustrations of two typical examples of pinned rhomboid panels used respectively with truss and plate girder Wichert continuous spans

and the truss spans in section (5); the latter were lifted in three pieces with the assistance of intermediate falsework. The R.S.B. and girder spans in sections (3) and (4) were erected simultaneously with the main truss spans, and in a manner similar to those of section (6). The 130-ft. and 160-ft. spans in section (1) were erected in two and three pieces respectively, in the same way as the truss spans.

This bridge connects Maryland with West Virginia and has been built jointly by the State Roads Commissions of those states to carry the inter-State highway over the Potomac valley. As well as the Potomac river and the B. & O. Railroad, it spans the Tonoloway Creek and Route 40—section (1)—and the Western Maryland Railway and C. & O. canal—section (3). The fact that this happens to be a road bridge does not indicate that the Wichert span is suitable only for highway structures; it is equally adaptable for railway bridges.

Dublin Parcels Delivery

The Dublin United Tramways Company, practically from its inception, has undertaken parcels delivery by collecting vans and tram services, but found it necessary to discontinue this service in June of this year. With the advent of motor traffic, the large firms in Dublin which had formerly used the tramway delivery for despatch of their parcels, found it more economical to provide their own motor vans for direct delivery. The tramways company, having withdrawn trams from many services and substituted motorbuses, had not the same delivery facilities, as the buses do not have platform space front and rear.

Road Transport and the War—13

The value of buses in emergency—Road transport services during air raids—Protection for buses and staff—Fuel prices and alternative fuels

Violent and widespread air attacks on the London area during recent weeks have necessarily caused some temporary interruptions to London suburban rail services, a term which includes main-line railways, London Transport railways, tramways, and trolleybus routes. We have already referred on more than one occasion in THE RAILWAY GAZETTE to the remarkable genius for improvisation which so many British subjects seem to possess and which has been brought into play day after day in devising alternative routes so as to cause the minimum delay to workers travelling between their homes and offices. In the provision of such alternative routes road motor transport has played an outstanding part, and it is improbable that many members of the travelling public realise the extent to which they are indebted to the activities of a "flying squad" of about 600 London Transport buses that have provided temporary replacement of tram services (with posters labelled "Tram Service"), and have afforded links in broken chains of rail communication. The latter vehicles have carried railway passengers only and have been specially labelled :—

EMERGENCY SERVICE
RAILWAY

Of course it cannot be claimed that perfection has been achieved, and indeed such would be unlikely in the ever-changing situation, but minor failures are always more apparent than major achievements in the provision of emergency services, and while admission must be made of some failures for which the reason is not readily apparent to the travelling public, tribute must also be paid to the broad success of the emergency arrangements.

Transport Services During Air Raids

In the early days of September the Prime Minister gave a clear lead to the country that enemy air attacks were not to be allowed to diminish our war effort. A letter dated September 11 was sent by Sir Leonard Browett, Secretary to the Ministry of Transport, to the Transport & General Workers' Union, the Municipal Passenger Transport Association, the Omnibus Owners' Association, the Public Service Transport Association, Associated Road Operators Limited, the Commercial Motor Users' Association, the Scottish Commercial Motor Users' Association, the London Passenger Transport Board, and the Scottish Road Passenger Transport Association. In this letter it was pointed out that the Minister was aware that drivers and conductors of buses, trams, and trolleybuses, in various parts of the country had been in some doubt as to what they should do when an air raid warning had been sounded. Sir Leonard Browett added that, as a result of the guidance given by the Prime Minister, no such doubt need exist any longer, and he said that the Minister of Transport was confident that those engaged in passenger transport, mindful that the maintenance of output was dependent on their services, would continue to carry passengers desiring to travel after the sirens had sounded until there were definite indications that an actual attack in the vicinity was likely to take place. A recommended policy for the operation of passenger vehicles during air raids was then formulated by the National Council for the Omnibus Industry, representing the company-owned provincial bus undertakings in Great Britain and covering about 90,000 employees. In London and in many provincial places this course has now been adopted, and local arrangements between the managements and the employees have been made to secure the most satisfactory means for suspending service and taking shelter, and for resuming work before the "raiders passed" signal has been sounded but when the immediate danger has passed.

Anti-Blast Netting for London Buses

To reduce the risk of accidents from blast in bus windows broken as the result of air raids, anti-blast adhesive netting is now being fixed to the windows of a number of buses and trolleybuses owned by the London Passenger Transport Board. For the moment the scheme is experimental, and it is not the board's intention to equip all its vehicles until the results are more clearly known. Meanwhile, demonstrations have proved that the netting is effective, and the extent to which the idea is adopted depends partly on how far the netting stands up to wear and tear, and also on its reception by passengers.

Helmets for London Transport Road Staff

The first of 36,000 protective fibre helmets for the drivers and conductors of London Transport buses, trams, and trolleybuses, and other road staff, is expected to be delivered this week. They are being issued to the men as

Two views of a London Transport bus fitted experimentally with anti-blast adhesive netting

they are received. The board's railwaymen have already been provided with helmets.

Shelters for London Bus Queues

To protect passengers from rain in the coming winter, the London Passenger Transport Board, in conjunction with the police and local authorities, is erecting queue shelters at some of the busiest stopping places for road vehicles. The first of these shelters, which are temporary structures, has been built outside the National Gallery.

Sleeper Buses

Regular nightly bus services from crowded East End areas of London to shelters in the city and the west end are to be instituted as soon as the authorities have equipped the shelters with bunks and sanitary accommodation.

Since the last week of September a service of " sleep coaches" has been in operation to convey Londoners to quiet country spots for the night. Intending passengers secure tickets in advance; the coaches make a supper call *en route*, and eventually the coaches are parked in country spots to permit the passengers to sleep.

New Platform Lamp for Road Vehicles

Persons travelling during the blackout will find it easier in future to board and leave London Transport buses, trams, trolleybuses, and Green Line coaches. The board's engineers have devised a new type of lamp which softly floodlights the boarding platform and the pavement near it. The Ministry of Home Security and the Ministry of Transport have given their approval and the lamp is being fitted to 1,000 vehicles a week. Work was begun at the beginning of September and the whole road fleet of 8,000 vehicles is due to be equipped by October 30. Many lamp shades were tried in a number of different positions. The shade finally adopted suggests an odd-shaped wind instrument, with three square pipes, through which the light is directed downward. It is fixed under the canopy directly over the top of the platform. The brightest spot in the field of light measures only 0·005 foot candles.

Cars in Central London

The Ministry of Transport announced on September 13 that, in order to maintain freedom of movement on the roads, drivers should bring private cars into such areas as Central London only when they have urgent or necessary work to do. Drivers entering or leaving these areas are asked not to do so with empty seats, but to give other persons a lift whenever they can.

Car Lights and Air Raids

Some excellent advice has been given by our contemporary, *The Commercial Motor*, which points out that, although during the hours of darkness when a " purple " warning has been given, it is the usual practice for the police to stop drivers and ask them to extinguish their headlamps, there appears to be no machinery to indicate to many drivers when headlamps may again be used. The suggestion, which we understand originated with the Royal Automobile Club, is to keep an eye on public service vehicles, as their staffs are usually informed fairly soon, and then again to use the headlamps and interior lights. Otherwise, it is better to continue on the side lights until precise information can be obtained from a police post.

Motorcar Identity Letters

In addition to the combination of letters and numbers which make up the registration mark of motor vehicles in this country, various other approved letters have been attached for many years past, such as international touring letters. In wartime practically all these have disappeared, with the exception of the familiar CD (Corps Diplomatique). Within the past few months, however, a new series of initials in a white circle has appeared on military cars, indicating the military area of origin. LA indicates the London area, EA the Eastern, SA the Southern, NA the Northern, and MA the Midland.

Road Traffic in the Event of Invasion

Various Regional Commissioners have issued statements to the effect that in certain circumstances, for example, in the event of invasion being attempted by the enemy, they may find it necessary to issue directions under the Defence (General) Regulations, 1939, in order to limit the number of vehicles using the roads, so that the movement of military or other essential traffic may not be hampered. The movement of private vehicles may be restricted very drastically, and in some areas vehicles may have to be made incapable of movement by removal of essential parts of their mechanism, or otherwise. Subject to the military situation, there will be the minimum of interference with other vehicles essential to the life of the community. Notice will be given to the public in the region concerned if it becomes necessary to issue such directions.

Petrol and Oil Prices Raised

On September 23 the Petroleum Board announced that it had been found necessary to increase the prices of petroleum products as from the opening of business on the next day. The board added that the advances, to which the Government had agreed, were due to increased operating costs. The increases made (per gallon) were :—

Pool motor spirit, 1d.
Pool diesel oil for road vehicles, 1d.
Pool paraffin and vaporising oil, 1½d.
Pool white spirit, ½d.
Pool gas oil, ½d.
Pool diesel oil (other than for road vehicles), ½d.
Pool fuel oil and heavy fuel oil, ½d.

The price of pool bitumen was raised 10s. a ton. Pool motor spirit in England and Wales and South Scotland now costs 2s. 0½d. a gallon. The wholesale price is 1s. 9d. a gallon. The previous increase in the price of petrol—from 1s. 10d. to 1s. 11½d. a gallon—was announced on May 21. Before rationing began on September 22, 1939, petrol was 1s. 5d. and 1s. 7d. a gallon.

Mobile Gas Compressor

To provide an emergency outfit by which a vehicle could be enabled to travel if no ordinary fuel was available, Mr. J. Maina has invented a two-wheel trailer carrying high-pressure storage cylinders and an engine-driven gas compressor set (Patent No. 521,204). The compression is intended to be carried out in two stages, and two of the bottles will contain medium-pressure gas and the other three high-pressure gas.

Alternative Liquid Fuels

In reply to a query on the use of creosote as fuel, the Ministry of Transport wrote to the Municipal Passenger Transport Association that all liquid motor fuels, whether imported or home-produced, must be treated on the same basis for rationing purposes. The Motor Fuel Rationing (No. 2) Order, 1940, requires the surrender of coupons against the purchase of all hydrocarbon oils used as fuel for motor vehicles, and if operators wish to use benzol, creosote, or appropriate preparations of coal-tar products, the total amount of fuel, whether alone or in admixture with petrol or diesel oil, should not exceed the equivalent amount of petrol or diesel oil which the rationing authority would have been prepared to authorise if no alternative fuel had been used.

Alternative Solid Fuels

Speaking in the House recently, Mr. Grenfell, Secretary for Mines, said that as regards the use of coal fuels for road transport there was the question of obtaining suitable fuel and also of securing enough steel to make gas producers. About two months previously it was considered that 2,000 motor lorries was the limit for which materials could be obtained, but Mr. Grenfell thought that the figure could now be put higher. The Ridley Committee had submitted a report on the subject, and he hoped that a discussion of it in the House would be possible.

Producer-Gas Lorries

Carter, Paterson & Co. Ltd., which for some time has been operating nearly a score of producer-gas vehicles of 3 to 4 tons capacity, now plans to increase its total of such vans to over 100, of which 60 will have the plant mounted on a trailer and the remainder will have chassis-mounted equipment.

NEW ZEALAND SOUTH ISLAND MAIN TRUNK EXTENSION

Construction of the 78-mile link necessary to complete the 604-mile South Island main line was abandoned in 1931, but has since been resumed, and is notable for the extensive use of machinery for heavy engineering works

IN 1936, the Government decided to continue the construction of the South Island main trunk railway extension over the stretch of 78 miles separating the isolated Picton section from the Canterbury portion of the main South Island system, work upon which had been abandoned during the depression. When completed, this line will complete the through railway communication for 604 miles from the Bluff, at the southern end of the South Island, to Picton, the port opposite Wellington on Cook Strait, which is less than 3½ hours' steaming time from the capital.

Progress since the work was resumed by the Public Works Department late in 1936, is such as to warrant the hope of completion (subject to the supply of steel from overseas) by June or July, 1941. At the time of resumption it was estimated that the earthwork to be handled would amount to 1,750,000 cu. yd.

The work is divided into two main sections, the northern, from Wharanui to Kahautara river, a distance of 48 miles 70 ch.; and the southern, from the Kahautara river bridge to Parnassus, a distance of 29 miles 40 ch.

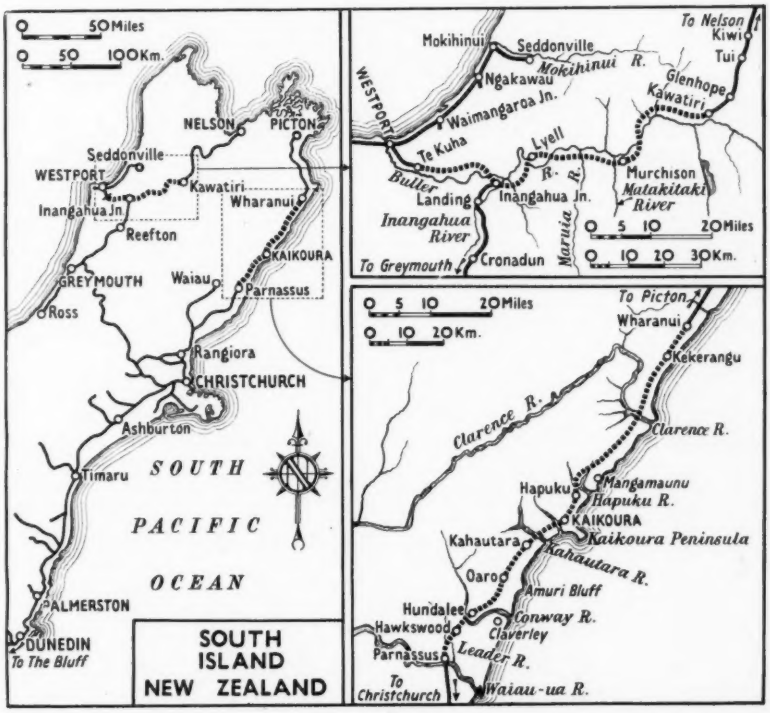
Bridges

One of the most notable features of this construction work is the number of major bridges, of which there are 29 on the northern and 15 on the southern section. The principal bridges on the southern section in the first 10 or 15 miles northwards from Parnassus are those over the Leader and Conway rivers. They are of equal length, 720 ft., and each consists of 16 spans of 45 ft., with plate girders on concrete piers, founded on piles in the case of the Leader, and on solid papa rock in the case of the Conway. The Okarahia bridge also on the southern section will consist of seven 43-ft., one 40-ft., and one 35-ft. reinforced concrete spans, some of which will be 75 ft. above ground level. Of a similar type is the Oaro bridge of three 45-ft. and six 40-ft. spans.

On the northern section the Clarence river bridge consists of twelve 122-ft. steel trusses with two 30-ft. plate girder shore spans. The foundations are of reinforced concrete caissons for the river piers, and concrete piles for the abutments. The caissons are 17 ft. by 6 ft. 6 in. in section and were sunk 35 ft. into water-bearing river shingle and boulders, under compressed air. Frequently it was found necessary to blast boulders in the working chamber. The Hapuku river bridge, also on the northern section, consists of 23 filled spandrel arch spans of 67 ft. each; the work is well under way, and it is hoped to have it completed by July.

A spectacular work was the great Hawkswood cutting, about four miles north of Parnassus, which, thanks to modern machinery, was more economical to construct than a tunnel. A 1½-cu. yd. Ruston steam dragline excavator was used to dig a preliminary gullet 30 ft. deep and about 60 ft. to 70 ft. wide at the top, and an 8-cu. yd. carry-all and caterpillar tractor was provided to rehandle and spread the material clear of the final batter lines. Two ¾-cu. yd. diesel shovels were started at the south end on successive levels below the steam dragline excavation, and later a second steam dragline was put into operation. The first dragline having excavated the gullet for the whole length of the cutting, both machines were then put on to widening the upper level. A third ¾-cu. yd. diesel shovel was then started at the north end of the cutting, working south. Later the south-end second lift-shovel was converted to work as a dragline, and, after digging a bench for the steam dragline on the right batter to work from, was moved to pull the batters down for the north-end shovel to load into trucks.

All machines were working round the clock in three shifts, material being led to bank by trucks and steam locomotives. The rehandling of spoil from the steam draglines was done by the 8-yd. carry-all and tractor and by an angle-dozer and tractor. The best four-weekly output of the machines was 43,780 cu. yd. Of the 291,439 cu. yd.



Two maps, (left) showing the position of the extension relative to other South Island lines, and (lower, right) the extension in greater detail

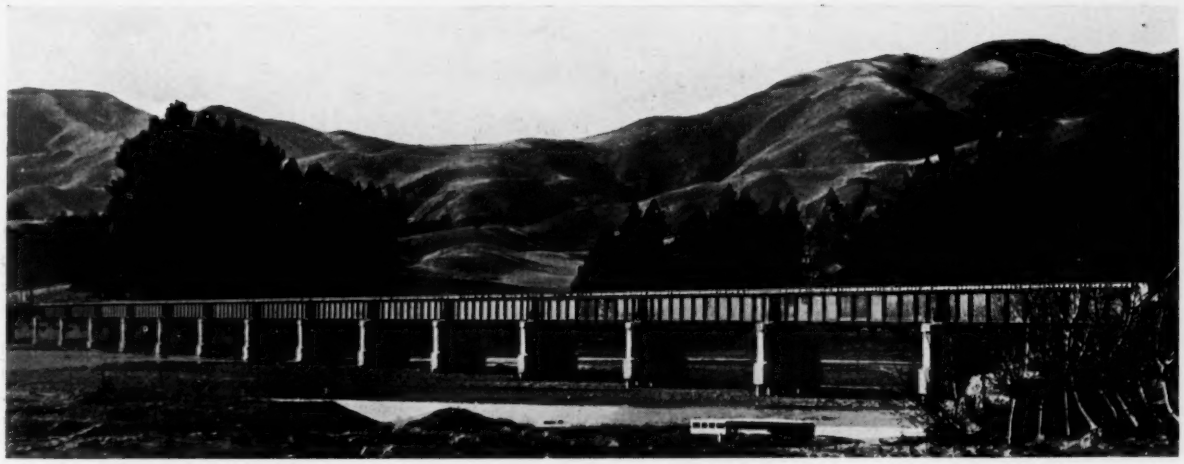
Hawkswood cutting, looking south

General view of Hundalee station and its surroundings

The south end of Amuri Bluff tunnel, showing cut-and-cover construction and machines excavating 20,000 cu. yd., to circumvent unstable valley bed

The Blue Slip, consisting of half-a-mile of moving pug hillside, with mechanical shovel excavator loading contractors train with debris

SOUTH ISLAND MAIN TRUNK EXTENSION, NEW ZEALAND GOVERNMENT RAILWAYS



Leader River viaduct, 16 spans of 45 ft. girders supported on concrete piers founded on piles

left in the cutting when the works closed in 1931, approximately 248,000 cu. yd. had been excavated by the end of June, 1937—after less than 12 months' working.

Formation work is now proceeding between Kaikoura and Kahautara, seven miles southward. A large camp for the workmen was recently established near Kahautara. On the Kaikoura (southern) section a total of 400,000 cu. yd. of railway and road excavation was shifted during the first two years' work. The bulk of the excavation was in difficult country, consisting of clay and boulders in talus slopes, resulting in very high batters.

Slips and landslides were frequent over the whole line and, in some cases, proved extensive and costly. The famous Blue Slip, which is a moving hillside of pug over half-a-mile long, and ten chains to thirty chains wide, had always been considered rather a problem, but excavation proceeded steadily. The engineers' estimate provided for the removal of from 250,000 to 500,000 cu. yd. of spoil before this slip could be stabilised. This work was tackled energetically with diesel shovels.

Tunnels

Tunnelling is carried out on the co-operative contract system, and the work is highly mechanised. All drilling is done with compressed air either from a large central station in the case of the longer tunnels, or with batteries of portable compressors on the smaller jobs. Mucking out is effected by means of pneumatically-operated steel scrapers and slides as in modern mining practice. Lining is placed by means of cement guns from which concrete is blown into place behind the steel profiling with compressed air. The steel profiling is carried on travelling gantries which straddle the muck trucks and can be shifted forward, section by section, as the work proceeds. At the south end of the line, tunnelling was the controlling feature, there being $2\frac{1}{4}$ miles to pierce in 15 tunnels. Altogether there are 20 tunnels on the whole section, with an aggregate length of three miles.

The longest is the Amuri Bluff tunnel, about 39 ch. in length. It was some distance from a formed road, and before anything could be done service roads had to be made to both ends for distances of $2\frac{1}{2}$ miles at the northern and $1\frac{1}{2}$ miles at the southern end.

At the southern end of the tunnel, conditions were particularly difficult owing to the very unstable nature of the valley floor and the landslides which occurred at the approaches to the portal. Men and machines were therefore concentrated on this locality in order to get under cover before the winter of 1939. By adopting cut-and-cover methods, and by excavating 20,000 cu. yd. with shovel, dragline and bulldozer, $4\frac{1}{2}$ ch. of heavily reinforced tunnel barrel was built in the open, and this enabled the work to proceed in safety after the weather broke. The material through which the tunnel has been driven, particularly at the northern end, is very liable to swell, exerting heavy pressures on the lining which has had to be strengthened to meet the difficult conditions.

There are now evident signs of increasing hardness in the stratum of this tunnel, and it is therefore proposed to change to the American system of timbering and to use rock-drills and scrapers forthwith. About 600 ft. of lining from the south end, and 1,500 ft. from the north end, are already completed.

Well over half the total length of 11,500 ft. of tunnelling on the southern section is completed, and progress is now at the rate of 500 ft. a month. Owing to the extremely high and unstable batters involved in the original alignment, it was found advisable to adopt a new route for about $1\frac{1}{2}$ miles in one locality, and this introduced two additional tunnels.

Sea Erosion

Sea-protection forms quite a large part of the work along the coast for about eight miles near the Kahautara river. There are numerous road deviations necessitated by the location of the railway, and in many of these places banks encroach on the sea a considerable distance. It was estimated that nearly 100,000 cu. yd. of heavy stone up to about six tons or more in weight would be required for building the faces and pitching them, or for retaining walls. This work is two-thirds completed.

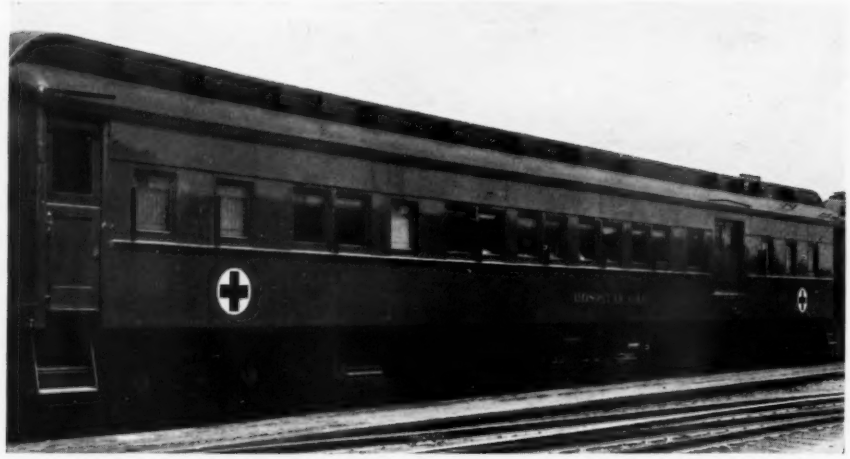
Some of the principal items of machinery and equipment at the southern end of the works are as follow:—

One air lock; one 800-ft., one 600-ft., five 200-ft., and three 85-ft. air-compressors; three ventilating fans, six crawler type diesel-engined excavators; two steam draglines on crawler tracks; five diesel generating sets; one diesel locomotive; nine steam locomotives; ten concrete mixers; twelve sets of steel profiling for tunnel lining; fifteen pumping plants; two diesel crawler-tractors and carry-alls, three oil winches; two scraper winches, slides and hoes; and workshops equipment and trucks of all descriptions. The northern end is similarly equipped.

During December, 1939, the Railways Department took over from the Public Works Department a 12-mile length of completed line from Parnassus to Hundalee, this being made possible by the completion of the Conway river bridge. Work is being pushed forward steadily towards Kahautara river, about 18 miles north of Hundalee

XUM

Railways and the War—39



Above : Hospital car for Canadian casualties, prepared for the Royal Canadian Army Medical Corps at the Montreal shops of the Canadian National Railways

Left : Interior view of hospital car, converted from a C.N.R. sleeping car. Cots have replaced the lower berths. This vehicle, the first unit of its type, was briefly described on page 286 of our September 13 issue

Extra wide doors which have been provided at each side of the vehicle to allow ample room for stretcher cases to enter and leave

Kitchenette to provide special diets for wounded soldiers

RAILWAY NEWS SECTION

PERSONAL

London Transport announces that Mr. W. A. J. Clark has been appointed Assistant Solicitor (General). Mr. Clark joined the Underground Electric Railways Co. of London Ltd. in 1921 as a clerk on the staff of the Legal & Parliamentary Officer. In 1934 he was appointed Assistant to Mr. C. G. Page, who was then the Parliamentary Officer of the London Passenger Transport Board. Upon the appointment of Mr. Page as Secretary & Chief Legal Adviser, Mr. Clark was given an opportunity of qualifying as a Solicitor. He entered into Articles with Mr. R. B. McDonald (now Chief Commercial Officer of the board) in 1937, and passed the Solicitors' Final Examination in 1940 with distinction. He was made an officer of the board on September 5, 1940, with the title of Assistant Solicitor (General).

Mr. Sidney E. Garcke has been elected a Director of the City of Oxford Motor Services Limited to fill the vacancy caused by the death of Mr. F. E. Stanley.

We regret to record the death of Mr. Hale Holden who, until his resignation in July, 1939, from the chairmanship of the Southern Pacific Company, was one of the leading railway magnates in the United States. Mr. Holden was 71 years old.

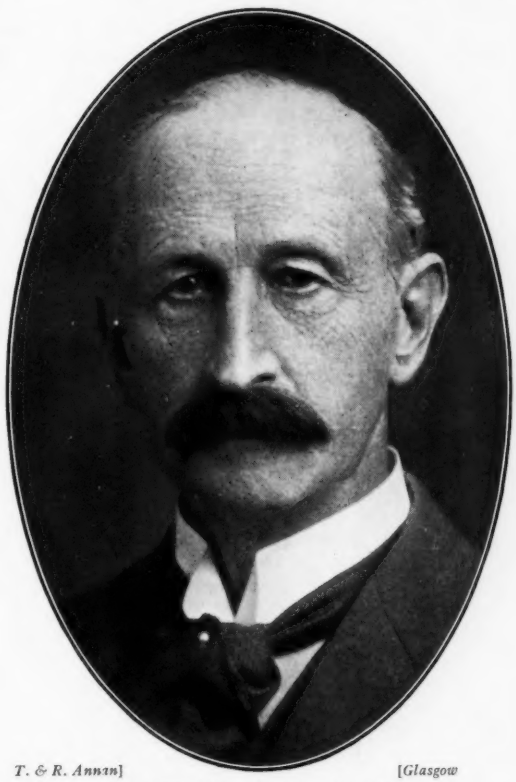
Mr. Harry B. Beaumont, formerly Steamship General Passenger Agent for the Canadian Pacific Railway, has been appointed Assistant Steamship Passenger Traffic Manager of the railway, in succession to Mr. Weldon G. Annable, whose death we recorded in our August 16 issue.

We regret to record the death on September 6, at West Orange, N.J., of Mr. Leonor Fresnel Loree at the age of 82. Mr. Loree retired from the presidency of the Delaware & Hudson Railroad in April, 1938.

Mr. Joseph Walker, Assistant Traffic Manager, Great Northern Railway (Ireland), Belfast, is to retire, but his consultative services are to be retained.

Mr. W. A. F. Graham, Assistant to the General Manager, Great Northern Railway Company (Ireland), Dublin, has been appointed Deputy Traffic Manager of the company with headquarters in Belfast. Mr. Graham took up his new duties on October 1.

Mr. Andrew Thomson Reid, Chief Managing Director, North British Locomotive Co. Ltd., whose death on September 16 we recorded in our issue of September 20, was born in Manchester on July 17, 1863, and was the son of the late Mr. James Reid who in the 1850's joined Neilson, Reid & Company of the Hyde Park Locomotive Works, Glasgow, a firm which was founded in 1837. Mr. A. T. Reid entered Glasgow Academy at the age of nine, and later attended Loretto School, Musselburgh,



T. & R. Annan] [*Glasgow*

The late Mr. Andrew T. Reid
Chief Managing Director,
North British Locomotive Co. Ltd.

leaving in 1881 to take a scientific training at Glasgow University. In 1883 he began a five-year pupilage with his father's company, and received a thorough training in the pattern shop, foundry, and smithy, and in the fitting, machine, boiler, and erecting shops, and ended up by spending 18 months in the drawing office. In 1888 he entered the estimating and purchasing departments of the company, and remained there until January, 1893, when he became a partner and took an active part in the management of the firm. In 1903 Neilson, Reid & Company; Sharp, Stewart & Co. Ltd. of Atlas Works, Glasgow (founded at Manchester in 1828); and Dübs & Company (founded in 1864); were amalgamated under the style of the North British Locomotive Co. Ltd., which was registered on February 12, 1903, as a limited liability company. Mr. Reid was appointed Managing Director of the Hyde Park works of the new company, and took charge of the design and manufacture of locomotives. In 1935 he became Chief Managing Director in succession to his brother, the late Sir Hugh Reid, Bart. Mr. Reid was a Member of the Institution of Mechanical Engineers and of the Institution of Civil Engineers; he was also a Justice of the Peace, and Deputy Lieutenant of the City of Glasgow and the County of Perthshire. He held the Volunteer Officers' Decoration and was gazetted a Lieutenant-Colonel in 1907. Mr. Reid was the last survivor of five sons. He and his brothers Sir Hugh Reid, Sir John Reid, and Mr. Walter M. Neilson Reid, were all connected with their father's firm, and played an outstanding part in its expansion and growth. The fifth son was the Right Rev. Dr. E. T. S. Reid, who was at one time Bishop of Glasgow and Galloway, and of St. Andrews.

We regret to record the death on September 30 of Sir Robert Abbott Hadfield, Bart., the eminent metallurgical chemist and industrialist.

We regret to record the death, in Rio de Janeiro on February 2, of Mr. Albert Harry Roberts, Traffic Manager of the Leopoldina Railway since March, 1913. Mr. Roberts was born at Leicester on January 5, 1879, and went to Brazil in 1899 where he entered the service of the Leopoldina Railway in the Accounts Department. After a short time his inclination for traffic working became pronounced and it was not long before he was transferred to that department, where he made rapid progress. He was appointed Traffic Manager in 1913. He was intimately connected with the Brazilian Railway Clearing House which owes much to his ability, as, apart from serving on the board for a number of years, he was partly responsible for its inception.

The Army Council has announced that Lt.-Colonel H. B. Everard, of the Sherwood Foresters, is a prisoner of war. Colonel Everard is District Engineer, Derby (South), London Midland & Scottish Railway. We understand that he is in good health.

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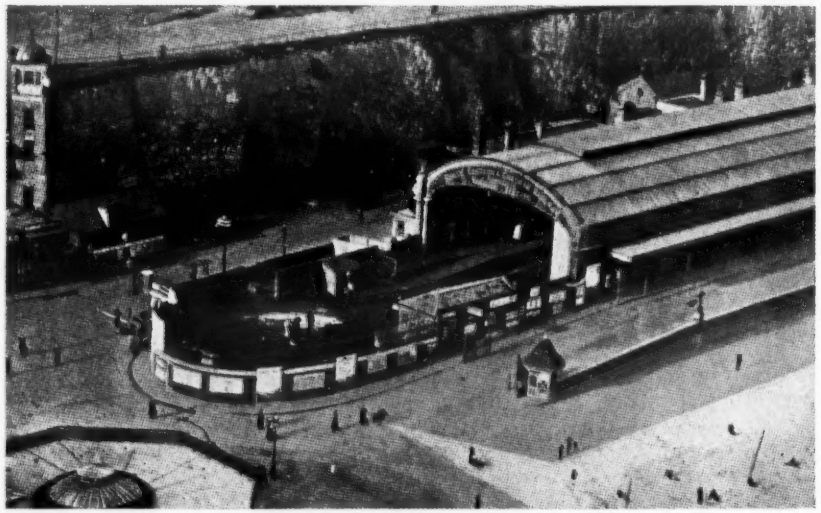
Ramsgate Harbour terminus, Southern Railway, viewed from the tunnel mouth prior to 1926

The same site as that shown alongside in use as a fair ground after the Thanet railway rearrangements of 1926



General view of Ramsgate Harbour station, the former terminus of the London, Chatham & Dover Railway. The approach tunnel now forms the nucleus of the Ramsgate air raid shelter tunnel system

Point near Dumpton Park where the old and new lines diverge. Left: Derelict tunnel to Harbour station. Right: New (1926) *connecting line to Dumpton Park station*

TRANSPORT SERVICES AND THE WAR—58

Air losses—Speedy repair work—Shelters in London tubes and derelict railway tunnels in Ramsgate and Malta—The air raid warning system—Continental railways and air lines

The unavoidable temporary interference with railway services which has attended the waging of persistent air warfare on the London area lends interest to the results of the air battles which have been fought over this country. The daily figures of losses of aircraft by both Britain and Germany, as has been apparent from the daily announcements of the Air Ministry, have almost invariably been favourable to the British defences. From the beginning of May until the end of September German losses of aircraft amounted to 4,565 and those of the British forces to 1,314. In May, when the Battle of France was still being waged the figures of losses were: German, 1,870; British, 258. In both August and September the German losses exceeded 1,000 machines. The figures in August were: German, 1,101; British, 368; September, German, 1,095; British, 376. The following figures show the daily loss of German and British aircraft of all types since August 11:—

TOTAL DAILY LOSSES OF AIRCRAFT

—	German	British	—	German	British
Aug. 11	67	29	Sept. 6	46	17
Aug. 12	62	17	Sept. 7	99	22
Aug. 13	78	27	Sept. 8	15	16
Aug. 14	31	11	Sept. 9	52	16
Aug. 15	181	37	Sept. 10	2	5
Aug. 16	76	25	Sept. 11	95	30
Aug. 17	—	—	Sept. 12	1	1
Aug. 18	152	22	Sept. 13	3	2
Aug. 19	6	6	Sept. 14	18	10
Aug. 20	7	2	Sept. 15	187	26
Aug. 21	14	2	Sept. 16	7	—
Aug. 22	10	5	Sept. 17	12	4
Aug. 23	4	3	Sept. 18	48	19
Aug. 24	50	21	Sept. 19	5	—
Aug. 25	55	28	Sept. 20	7	9
Aug. 26	50	17	Sept. 21	2	—
Aug. 27	6	1	Sept. 22	1	—
Aug. 28	28	16	Sept. 23	13	11
Aug. 29	11	12	Sept. 24	9	9
Aug. 30	63	27	Sept. 25	28	4
Aug. 31	94	39	Sept. 26	34	9
Sept. 1	25	16	Sept. 27	133	34
Sept. 2	55	23	Sept. 28	6	9
Sept. 3	25	15	Sept. 29	10	7
Sept. 4	54	19	Sept. 30	49	27
Sept. 5	39	23			

Ramsgate Tunnel Shelters

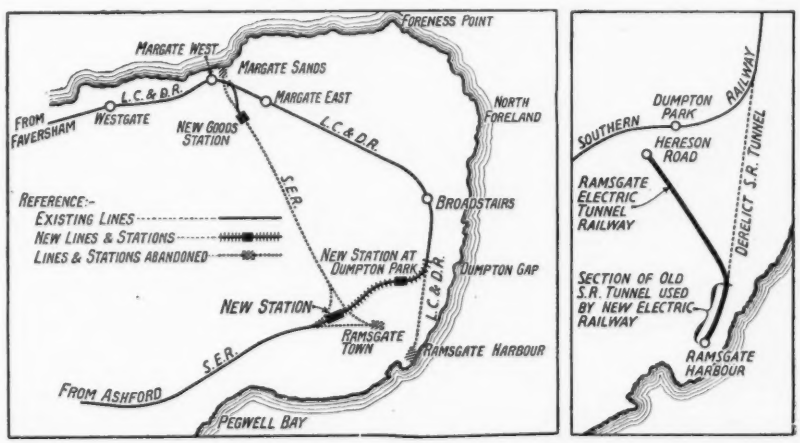
Despite having been subjected to some of the most severe air raids on any part of the coast, and to have had tons of high explosive and incendiary bombs poured on the town, Ramsgate has experienced a remarkably small loss of life, mainly by reason of its extensive system of tunnel shelters. Just before the war, the Borough of Ramsgate spent £60,000 in providing a total of 3½ miles of tunnel through the chalk foundations of the town, about 70 ft. deep. The peacetime population is about 34,000, and the tunnels are capable of sheltering 60,000. The principal tunnel shelter is the old railway tunnel of the former London, Chatham & Dover Railway leading to Ramsgate Harbour station. This was closed on July 1, 1926, when the Southern Railway lines in Thanet were rearranged.

For some years the site of Ramsgate Harbour station was used as an amusement park, and, except for housing lions in the tunnel mouth, the old tunnel remained derelict. Then in 1936 it was taken over by Warren & Company, the proprietors of the amusement park, as part of a scheme for linking the front at Ramsgate with Dumpton Park station, Southern Railway. It was decided to instal a 2-ft. gauge electric railway from the tunnel mouth at Ramsgate Harbour to a 10-acre plot of ground in Hereson Road, near Dumpton Park station. No light railway order or other powers were involved, as the line is entirely on ground owned by the Tunnel Railway Co. Ltd. of Ramsgate (the owner of the line), or in part of the derelict railway tunnel rented from the Southern Railway. Actually, about 300 yd. are in the old tunnel, and about 700 yd. in small new tunnel, of 9-ft. headroom above rail level. Construction was carried out very rapidly, for work was not begun until April 29, 1936, and the line was formally opened for public traffic on July 31, 1936.

Shortly after the outbreak of war traffic was discontinued on the electric railway between Dumpton Park and Ramsgate Harbour, but the track has not been dismantled. Leading from the old L.C. & D.R. tunnel are approximately 3 miles of additional tunnel (of smaller bore) driven through the chalk underlying the town and emerging in the chalk cliffs on the western side of the harbour. In all there are 18 entrances.

Colour-Light Signals in Air Raids

Criticism has been occasioned in some quarters by the brilliance of the railway colour-light signals as viewed from the window of a railway compartment. Accordingly, the Ministry of Transport has invited residents in the locality of these signals who may have misgivings on the subject to carry out the simple test of placing themselves in a position above or at right angles to the direction of the signals, when they will find that the beam emitted is very narrow. From a normal flying height the signals are invisible, as all signals of this type are carefully adjusted on erection so as to be in exact alignment with the driver's vision. Recently, as the result of complaints, the signals on a section of line in the London area



Left: Sketch plan of the Southern Railway Thanet lines rearrangement of 1926. Right: Ramsgate electric tunnel railway, which used part of the tunnel left derelict by the 1926 scheme; this tunnel now forms the principal tunnel shelter for Ramsgate, which has approximately 3½ miles of deep level shelter tunnel in the chalk underlying the town

were inspected by an officer of the Ministry. He reported that none of the signals appeared to be tilted upwards and had they been so tilted there would immediately have been complaints from drivers. Adequate signals are, of course, indispensable if rail traffic is to continue during air attacks. A committee composed of representatives of the Air Ministry, the Home Department, and the Ministry of Transport, which investigated the problem in 1938, reported that if the signals were fitted with a 2-ft. hood, no material assistance would be given to enemy aircraft at the height at which they would normally fly. These hoods have been fitted to all such signals.

The Air Raid Warning System

Whenever enemy aircraft approach this country their movements are continuously reported by members of the large staff of trained observers stationed round our coasts and throughout the country. All these reports are sent immediately, by direct telephone lines, to the headquarters of Fighter Command, R.A.F., where the course of the raiders is plotted on a central chart. With this information before them, and with their knowledge of possible targets and of the enemy's strategy, the officers at Fighter Command are able to form a judgment of the probable course of the raiders and their probable objective. It is they who decide what areas should be warned, and what warning message should be given. The original intimation of what warnings would be issued, both privately and publicly, was given in Air Raid Precautions Memorandum No. 8, the first edition of which was issued by the Home Office in May, 1938. This memorandum envisaged four types of message, which would be passed to selected recipients by coloured lights or by telephone (in the latter case indicating verbally the colour code). These four messages, their meaning, and the extent of their distribution were as follow:—

Name of Message	Colour Code	Distribution and Meaning
Preliminary Caution	Yellow	A message (for confidential information only) issued by telephone to a limited number of recipients who would take preparatory and unobtrusive measures to be ready to act instantly the Action Warning is received, which may be any time from 5 to 10 minutes later. The caution may also be issued to places where action in connection with air raid precautions requires considerable time to put into effect.
Cancel caution	White	A message (for confidential information only) issued by telephone to recipients of the "preliminary caution," meaning that the circumstances necessitating the issue of the "preliminary caution" are now passed. This message would be issued whether or not an "action warning" and a "raiders passed" message had intervened since the issue of the "preliminary caution."
Action warning	Red	A message (on which a public signal may be given) issued by telephone to selected recipients, meaning that an air raid may occur within 5 to 10 minutes, and executive action with regard to air raid precautions should be taken.
Raiders passed	Green	A message (on which a public signal should be given if one was given on the warning) issued by telephone to all recipients of the "action warning" meaning that the raiders have left the area or the threat of raid is no longer imminent.

It will be noticed that only two of these warning signals were to be conveyed to the public, namely, the "red" or "action warning" by means of "a fluctuating or warbling signal of varying pitch," and the "green" or "raiders passed" message by means of "a continuous signal at a steady pitch." In each case the duration was fixed at two minutes. Railways were included among the recipients of all warning messages, under arrangements made by the Home Office. In the early months of the war, the receipt of the "preliminary caution" or "yellow" message was the signal for certain precautionary steps to be taken, including the closing of flood gates on the London tube system, as indicated in the article published in our issue of October 13, 1939. Subsequently, as the result of experience it was found impracticable to adhere to the original arrangements in view of the widespread disorganisation to essential services which would have resulted from the rigid adherence to a rule which in practice meant a slowing-up over a wide area as soon as a solitary enemy aircraft crossed the coast.

Accordingly, an intermediate type of warning message called the "purple" came into operation on July 25, 1940. It is issued at night to areas in the course of the raiders and all exposed lighting in docks, factories, and transport undertakings (such as railway marshalling yards) must be extinguished throughout the area which receives it. These lights, if left, would give directional assistance to the enemy and might afford many markers for vital targets. When this message is received the police may direct motorists to extinguish their headlights. "Purple" messages, like "yellow" ("on the alert") messages, are confidential preliminary warnings, and it is still only on receipt of the "red" message that a public warning is given by sounding sirens. The "red" message with its public warning is deliberately limited to the areas which it is thought are likely to be attacked, and, as the judgment of Fighter Command cannot be infallible, it is inevitable that on occasion a raider expected to be making for a distant objective will drop his bombs elsewhere. Consequently, there are at times some bombs without warnings and some warnings without bombs. Incidentally, with the introduction of the "purple" message, the "green" was withdrawn, and the "white" now serves both to indicate "raiders passed" and also "cancel caution."

Since the development of the intensive and almost continuous series of air raids on the Metropolitan area, it has been found desirable to limit public warning to periods of really imminent danger, especially in daylight hours, as otherwise a handful of raiders could stop production everywhere and seriously hamper our own war effort. Moreover, the duration of the siren sound has now been reduced to one minute. In addition, arrangements are now in widespread use, with Government encouragement, whereby factories and offices continue to work even after the sounding of public sirens, and rely upon the observations of their own "roof spotters" to intimate the immediate approach of danger.

Speedy Repair Work by London Transport

Rapid restoration of railway services after severe damage, despite a threat from an enemy aeroplane, is described in a statement issued by London Transport, which says that early one morning recently a bridge carrying four London Transport railway tracks was damaged by a bomb, putting a section of the line out of service. Reserve buses were rushed to the scene and were ready, when the first trains arrived, to bridge the gap. In the meantime the board's engineers were meeting on the spot and by 10 a.m. a plan to restore the railway service had been devised and begun. It was decided temporarily to give up two tracks and to divert all traffic to the remaining two tracks. To do this the board's staff had to shift high-tension cables and entrench them, to build a new cross-over 200 ft. long and to reverse the the automatic signalling over two miles of line. Although work had to be stopped at night because of the blackout, the train service was restored by 6 p.m. next day. Early in the operations an enemy aeroplane swooped over the workers, but they carried on voluntarily under the protection of Home Guards armed with Bren guns.

The war emergency headquarters of the Chief Engineer (Civil) is the centre from which such work is directed. Here the engineers are in constant touch night and day with 17 constantly-manned posts and with the thousands of private telephones that link the London Transport system. They are surrounded with charts and maps and they have at instant call, in steel cupboards, drawings dealing with every detail of the railways, including bridges, tunnels, permanent way, and current rails; the signalling installation, telephones, lighting, clocks, and dials; all buildings; all drainage and ventilation plant; and all tram track. The work is carried out smoothly. A signal box reports, for example, that high explosive bombs have fallen near a junction. In a few seconds the engineer is speaking on the telephone to an inspector at the nearest post. The latter sets off with some of his men to investigate; bombs and fragments of A.A. shells may be falling, unlighted trains pass them in the blackout, they cannot use their flash lamps, but they get to the spot and discover what has happened. The men have never once hesitated to set out during the heaviest raids, and have always shown coolness and courage in searching for unexploded bombs, effecting immediate repairs, clearing debris, or dealing with any other emergency.

If damage has been done to the permanent way, the signalling, or a structure, and is so serious that it cannot be repaired in the dark, engineers are sent to the site, specially trained breakdown gangs are warned to be on the spot at dawn, material is ordered from the nearest depot, and the bus

controller is told, so that he may have buses ready to bridge the gap when the first trains arrive. Precise details of this vital work may not be given in present circumstances, but it may be recorded that, with few exceptions, all damage to the London Transport railways has been repaired and full services restored the day it has occurred. Interruptions caused by the presence of delayed action bombs have also been kept to a minimum.

Station Names to be Displayed Again

It has now been agreed by the Minister of Transport that railway station names may be displayed more freely than in the past. If they are situated under a station roof so that they cannot be seen or understood from a highway or low-flying aircraft, there is no limitation of the size of the lettering employed. Lettering which does not exceed 3 in. in height may be used in the open provided that it cannot be seen and understood from a highway. The railways are taking immediate steps to avail themselves of this relaxation, but, as many members of the staffs are actively engaged in repairing damage caused by enemy action, some little time must necessarily elapse before full advantage can be taken of the relaxation. We are informed, however, that no avoidable delay will be allowed to occur in meeting the convenience of the public to the greatest extent permissible.

Nightly Shelterers in London Tubes

The tacit recognition of the nightly use of London Tube stations as dormitory shelters has produced the operating difficulties which London Transport officials foresaw in earlier months when they took steps to prevent such a practice. At some stations queues are formed at early hours in the afternoon and claims are staked well before the night air raid warning is given. On September 29 London Transport found it necessary to issue a poster in the terms reproduced herewith. We are happy to be able to record that our own observations lead us to the conclusion that the vast majority of offenders are members of alien races or at least of alien extraction. We understand that three days earlier the police officers who have been detailed to control the crowds using tube stations as all-night shelters have received instructions from Scotland Yard to prevent overcrowding, or serious dislocation of traffic ; if necessary to turn away persons who are not genuine travellers ; and, should it become necessary to restrict admission to a station, to exercise discretion in favour of women and children.

On October 1 London Transport exhibited on all tube stations a poster which states:—" Passengers must be afforded free and uninterrupted use of the platforms and stations and the space used for shelter must therefore be limited. Only the space within the white lines may be used. The police have been instructed to enforce this arrangement and those seeking shelter are asked to help them in carrying it out. Stations and platforms must be vacated in the early morning and before the heavy passenger traffic begins. Only a limited amount of personal baggage, etc., will be allowed. Stations and platforms must be kept free from litter, which should be carried away or placed in receptacles provided."

Last week the shelter news sheet made its appearance when on September 26 the first number of *The Swiss Cottager* was produced. This is reproduced in facsimile in our Scrap Heap columns this week at page 351. It is hardly necessary to add that some of the sentiments expressed in this bulletin do not accord with the views of London Transport.

Advice to London Passengers

The following advice to assist passengers in wartime was given in a statement issued on September 25 by London Transport :—

1.—Complaints have been made of long queues outside Underground stations and at stopping places for road services. The chief cause is that, although transport is maintained so far as practicable during the period of an air raid warning, thousands of persons who have taken shelter rush to the transport services after the " all clear " signal, all desiring to travel at once. In their own interest, and that of people having urgent business, passengers who can possibly do so are asked to delay travelling until after the first rush has ended.

2.—The temporary diversion of some road services and interruptions of others has brought into use new stopping places not marked with " please form queue " signs. It is desirable in the interest of the passengers that they should form queues at all stopping places. The board's officials supervise the queues at as many points as possible, but they are so occupied with the provision of additional or special services that they cannot supervise all stopping places. Passengers are, therefore, asked to form queues of their own accord and to ensure that they are orderly.

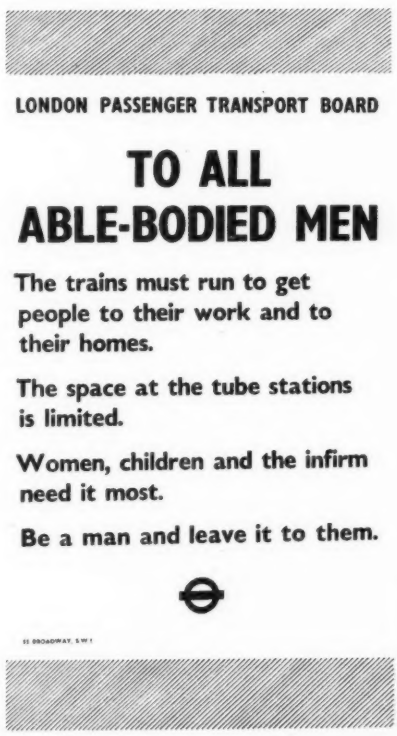
Further Evacuation from London

During the past weekend more than 11,000 London women and children were evacuated from heavily-bombed areas to country areas. They were accompanied by volunteer escorts and L.C.C. officials to various London stations and thence conveyed by railway. More than 6,000 evacuees left London on Saturday last, September 28, and another 5,000 on Sunday, September 29. The movement is continuing daily.

Shelters in Derelict Malta Railway Tunnels

The island of Malta, with a length of 17 miles and a breadth of 9 miles, has a total area of 91½ sq. miles, and a population in 1931 of over 240,000, which has since risen to an estimated figure in excess of a quarter of a million. It is thus one of the most densely-populated parts of Europe. Since the entry of Italy into the war it has been subjected to repeated aerial bombardment, an Italian activity made comparatively easy by the fact that Malta is only 58 miles from Sicily. Nevertheless, it would seem that the death roll among the civilian population has been remarkably small, and this is due in no small measure to the fact that the island has extensive deep-level fortifications which are survivals of its stormy mediæval history. In addition, a considerable amount of shelter is afforded by the derelict tunnels of the old 7½-mile Malta Railway which was abandoned nearly ten years ago.

The undertaking was begun by London interests which formed the Malta Railway Company and in 1883 opened a single track metre-gauge line extending from a point just within the main gate (Porta Reale) of the capital city of Valletta, into a tunnel 730 yd. long under the fortifications, and up to the old capital of Citta Vecchia, 600 ft. above sea level. After some years of working difficulties, the Government took over the line, reconditioned it, and reopened it


LONDON PASSENGER TRANSPORT BOARD
TO ALL
ABLE-BODIED MEN
The trains must run to get people to their work and to their homes.
The space at the tube stations is limited.
Women, children and the infirm need it most.
Be a man and leave it to them.

Poster issued by the London Passenger Transport Board on September 29 and widely displayed on tube stations

in 1892. Until 1900 the railway ended at Notabile (Citta Vecchia) but in that year an extension was opened to the terminus at Museum station, on the opposite side from the hill at Notabile, and this extension involved the construction of the 600-yd. tunnel which has a rising gradient of 1 in 40 towards Museum station. The tunnel runs through a belt of clay and presented considerable structural difficulties, owing to the water encountered and also to the shrinkage of the clay on drying. For the latter reason not more than 6 ft. could be bored at one time before it became necessary to line the excavation. In places the tunnel is a complete stone tube of circular section. Work on this tunnel was begun in 1896 and took four years to complete. After having been operated at a loss for some time, largely as the result of road competition, the railway was closed at the end of March, 1931.

Women Goods Porters on the L.M.S.R.

Women goods porters are being engaged by the L.M.S.R. to replace male employees called up for active service where substitute male labour is not available. Already, 250 women have been taken on, chiefly in the Midlands and the North where the shortage of male labour is most acute. These women porters, who work under the supervision of men, are employed at the principal goods depots. Many of them are married women and relatives of railwaymen. Their job is to load and unload a variety of goods each weighing about 75 lb. including bedsteads, bales of cloth, ploughs, rubber tyres, and drums of oil and paint.

Summer Time

A German radio announcement states that summer time in Germany and German-occupied territories, which was due to end on October 6, is to be continued indefinitely in order to give the population of areas visited by the R.A.F. the advantage of one hour's extra sleep.

Summer time is being continued in Eire until November 17 in order to coincide with practice in Great Britain and Northern Ireland.

In Egypt summer time ended at midnight on September 30-October 1.

The Protectorate of Bohemia & Moravia

It has now been announced that Germany has decided to create a Customs and monetary union between the Reich and the Protectorate of Bohemia & Moravia and this became effective from October 1. This union presumably brings to an end practically the last vestige of economic autonomy in the Protectorate. The Czech crown is to be allowed to exist as a parallel currency to the Reichsmark in the Protectorate until the end of the year, but as an international currency it is to disappear. For purposes of foreign trade, the ratio of Rm. 1 to 11·72 Czech crowns has been established. It seems that the Railways of the Protectorate of Bohemia & Moravia, which comprise some 5,801 km. of standard-gauge line and 67 km. of narrow-gauge line, are to continue for the time being as a separate administration.

The Balkans

Although two months have passed since further claims on Roumanian territory were pressed, and in one case accepted in principle, the new frontiers of Roumania with Hungary and Bulgaria seem still to remain without precise delimitation. It became known on August 9 that Roumania and Bulgaria had reached "agreement in principle" on the question of the Bulgarian claim to Southern Dobruja, the basis of which was the cession by Roumania of a large strip of territory to Bulgaria and an exchange of populations. It was agreed on August 21 that Bulgaria should occupy this territory, and it seems that the new approximate boundary occupies a course roughly parallel with the main railway from Bucharest *via* Czernavoda to Constanza, but about 20 miles southward of it, thus approximating to the territory which Roumania acquired from Bulgaria in the Balkan wars of 27 years ago. It is stated that the new frontier runs from just north of Silistria (on the Danube) to a point on the Black Sea just south of Mangalia. Bulgaria occupied the ceded territory between September 15 and October 1.

The negotiations between Roumania and Hungary at Turnu Severin long resulted in deadlock, but by August 30 Roumania had agreed, under German pressure, to cede northern Transylvania to Hungary. The new frontier here runs somewhat south of the railway from Oradea to Cluj, then to the west of the Cluj—Teiush line, and then approximately due east (passing north of Brashov). A recent map of Roumania was reproduced at page 20 of our July 5 issue.

Railway Services in France

Railway communication between Paris and Marseilles has been re-established, according to a Vichy message from the Havas News Agency dated September 18. It is stated that the iron bridge over the River Iser, 10 km. north of Valence, destroyed during the German advance on June 24, has been reconstructed, and on September 17 the first train direct from Paris to Troyes, Lyons, and Marseilles crossed the bridge at 20 m.p.h. From September 18 a speed restriction of 40 m.p.h. was introduced.

A message from Zurich dated September 25 said that after the closing of the frontier between Switzerland and German occupied France, the Vichy authorities had closed the frontier between Switzerland and "unoccupied" France. It is said that the German-Swiss frontier was open for the few hours on September 30 to enable persons from Alsace and Lorraine who took refuge in Switzerland to return to their homes. They will not be allowed to return to Switzerland save in exceptional cases.

Arrangements have been completed for a direct goods train service between Germany and Spain, *via* German-occupied frontier territory, according to a radio announcement of September 20. The trains will cross the Spanish frontier at Hendaye-Irun.

Recent reports have indicated that, in addition to the fixed gun positions established by the Germans on the coast line between Calais and Boulogne, there are six pieces of mobile artillery carried by rail on specially-constructed branch lines from the main line between Calais and Boulogne. Guns mounted on railway lorries were used similarly during the war of 25 years ago in connection with the German bombardment of Paris. The object, of course, is to remove the guns from firing positions which can be located and attacked.

R.A.F. Attacks on Enemy Communications

Popular interest in the continuous R.A.F. raids on military objectives in enemy and enemy-occupied territories, is undoubtedly devoted particularly to the raids on Berlin; if only because of the popular appeal of apparent reprisals for the German attacks on our own Metropolis. Many other places are of far greater military significance, but it is not so easy to assess the extent of the moral effect of a raid on Berlin. We have previously recorded in these columns some of the objectives which the R.A.F. has attacked in the Berlin area, and as a matter of interest we now record that no fewer than 16 bombing raids have been carried out over Berlin, namely, on August 25, 28, 30, 31, September 3, 4, 6, 9, 10, 11, 15, 23, 24, 25, 28, 30. On six occasions the official Air Ministry statements have specifically mentioned railway properties among the targets attacked, namely, on September 6 (railway yards); September 10 (Potsdamer terminus); September 11 (Anhalter station and railway yard); September 23 (Rangsdorf station and several goods yards); September 25 (railway yard, junction, and sidings); and September 30 (railways).

Air Lines

According to the Lyons radio, a daily air service between Vichy, Lyons, Toulouse, and Marseilles, for passengers, mails, and parcels, was begun on September 12. Other air lines stated to be working are Toulouse—Pau—Perpignan—Montpelier—Nice—Marseilles, and Vichy—Limoges—Clermont Ferrand—Grenoble. Several new air services in "unoccupied" France are promised for the near future.

There is now an Italian air line working every weekday between Rome and Lisbon. It is reported to have been begun on September 26.

An important air development in East Africa was the inauguration on September 24 of an extension of the Sabena (Belgian air transport) Congo service to include Entebbe, thus bringing East Africa into contact by air with all important centres in the Congo and linking the Congo with the British Oversea services.

XUM

NOTES AND NEWS

Agreed Charges.—Notice is given that about 600 applications for the approval of agreed charges under the provisions of Section 37 of the Road & Rail Traffic Act, 1933, have been lodged with the Railway Rates Tribunal. Notices of objection must be filed on or before October 8.

Northern Railway of Spain Reported Taken Over by Government.—According to a Reuters message dated September 28, it is announced in the *Official Bulletin* that the Northern Railway—one of the two largest lines in Spain—has been taken over by State Administration. This is the first major step taken under the provisions of the new law, giving control of all the railways to the State.

Belfast & County Down Railway Wages.—The Irish Railway Wages Board sitting in Dublin on September 27 decided that the 2½ per cent. deduction from wages and salaries on the Belfast & County Down Railway should be discontinued as from May 1 last, because of the improved position of the company. In May, 1940, the board had decided that the 7½ per cent. deduction should be reduced to 2½ per cent. as from May 1, the entire position, including retrospective payment, to be further considered in September, 1940.

Suggested Underground Railway for China.—According to a Reuters message from Shanghai, the first underground railway in China will be constructed in Shanghai within three years, if the plans of a group of Japanese interests materialise. Application for permission to construct the railway is understood to have been made to the Japanese-sponsored city authority of greater Shanghai. The railway, it is reported, would be 25 miles in length, and would cost 85,000,000 yen (about £5,000,000). A difficulty which will have to be faced is the nature of the soil which yields water at a depth of only a few feet.

Fuel Oil Burner Export Group.—Member firms of the British Oil Burner Manufacturers' Association, which specialises in the manufacture and application of oil burning equipment, have formed the Fuel Oil Burner Export Group under the export scheme fostered by the Board of Trade. Mr. W. A. Hubbard (Combustions Limited) as Chairman, and Messrs. O. Meilke (May Oil Burner (England) Limited), J. S. Greenhalgh (Babcock & Wilcox Limited) and C. Roman (Nu-Way Heating Plants Limited), form the executive committee of the group; the Secretary is Mr. Stanley Henderson, and the offices are at 69, Cannon Street, E.C.4. (Telephone: City 4444.) The following undertakings are members of the group: Amal Limited, Babcock & Wilcox Limited, S. Batchelor & Son Ltd., Combustions Limited, Laidlaw, Drew & Co. Ltd., May Oil Burner (England) Limited, Nu-Way Heating Plants Limited, G. C.

Irish Traffic Returns

IRELAND		Totals for 37th Week			Totals to Date		
		1940	1939	Inc. or Dec.	1940	1939	Inc. or Dec.
		£	£	£	£	£	£
Belfast & C.D. (80 miles)	pass.	3,554	2,428	+ 1,126	124,023	100,752	+ 23,271
	goods	715	602	+ 113	21,250	16,556	+ 4,694
	total	4,269	3,030	+ 1,239	145,273	117,308	+ 27,965
Great Northern (543 miles)	pass.	14,000	10,850	+ 3,150	455,400	431,400	+ 24,000
	goods	18,800	14,150	+ 4,650	465,700	380,200	+ 85,500
	total	32,800	25,000	+ 7,800	921,100	811,600	+ 109,500
Great Southern (2,076 miles)	pass.	40,956	42,299	− 1,343	1,338,362	1,416,371	− 78,009
	goods	48,369	55,646	− 7,277	1,686,392	1,512,019	+ 174,373
	total	89,325	97,945	− 8,620	3,024,754	2,928,390	+ 96,364
L.M.S.R. (N.C.C.) (247 miles)	pass.	5,430	3 780	+ 1,650	215,190	180,480	+ 34,710
	goods	4,590	3,730	+ 860	142,780	108,160	+ 34,620
	total	10,020	7,510	+ 2,510	357,970	288,640	+ 69,330

Irish Traffic Returns

IRELAND		Totals for 38th Week			Totals to Date		
		1940	1939	Inc. or Dec.	1940	1939	Inc. or Dec.
		£	£	£	£	£	£
Belfast & C.D. (80 miles)	pass.	3,572	2,474	+ 1,098	127,595	103,226	+ 24,369
	goods	720	584	+ 136	21,970	17.140	+ 4,830
	total	4,292	3,058	+ 1,234	149,565	120,366	+ 29,199
Great Northern (543 miles)	pass.	12,600	10,800	+ 1,800	468,000	442,200	+ 25,800
	goods	16,800	14,600	+ 2,200	482,500	394,800	+ 87,700
	total	29,400	25,400	+ 4,000	950,500	837,000	+ 113,500
Great Southern (2,076 miles)	pass.	35,068	38,771	− 3,703	1,373,430	1,455,142	− 81,712
	goods	49,482	57,425	− 7,943	1,735,874	1,569,444	+ 166,430
	total	84,550	96,196	− 11,646	3,109,304	3,024,586	+ 84,718
L.M.S.R. (N.C.C.) (247 miles)	pass.	5,460	4,210	+ 1,250	220,650	184,690	+ 35,960
	goods	5,960	3,810	+ 2.150	148,740	111,970	+ 36,770
	total	11,420	8,020	+ 3,400	369,390	296,660	+ 72,730

British and Irish Railway Stocks and Shares

Stocks	Highest 1939	Lowest 1939	Prices Oct. 1, 1940	Prices Rise/Fall
G.W.R.				
Cons. Ord.	38	21½	28	—
5% Con. Pref. ...	92	71	73	−½
5% Red. Pref. (1950)	98	83	93½	—
4% Deb.	103	91	101¾	—
4½% Deb.	105½	93¾	103½	—
4½% Deb.	110	99	108½	—
5% Deb.	121	109½	112½	—
2½% Deb.	63½	54	62	—
5% Rt. Charge ...	117	104	110½	—
5% Cons. Guar. ...	111	96½	103	−½
L.M.S.R.				
Ord.	17	9½	11½	—
4% Pref. (1923) ...	46½	20	30½	+½
4% Pref.	63½	37½	43	—
5% Red. Pref. (1955)	83	58½	73½	—
4% Deb.	98½	85	89	−½
5% Red. Deb. (1952)	109	101½	106	—
4% Guar.	87⅞	73	72½	−¾
L.N.E.R.				
5% Pref. Ord. ...	5¾	3⅛	2½	−½
Def. Ord.	3½	1¾	1½	—
4% First Pref. ...	38½	19	28½	+¾
4% Second Pref. ...	15	7⅜	9½	—
5% Red. Pref. (1955)	55	38	50	—
4% First Guar. ...	78½	60	63	—
4% Second Guar. ...	68¾	47	53½	—
3% Deb.	71⅛	57	61½	—
4% Deb.	93	76	82	—
5% Red. Deb. (1947)	106⅛	98	103	—
4½% Sinking Fund Red. Deb.	104½	96	99½	—
SOUTHERN				
Pref. Ord.	78	46½	39½	−½
Def. Ord.	19½	7	9½	−½
5% Pref.	100	76	71½	−1
5% Red. Pref. (1964)	102⅜	94	87½	—
5% Guar. Pref. ...	116½	103	104½	−½
5% Red. Guar. Pref. (1957)	112⅛	102⅛	103½	—
4% Deb.	103	91½	92½	−2
5% Deb.	118½	109½	112½	—
4% Red. Deb. (1962–67)	106	98	101½	—
4% Red. Deb. (1970–80)	102	96	100½	—
FORTH BRIDGE				
4% Deb.	98⅛	81	87½	—
4% Guar.	95	80	85½	—
L.P.T.B.				
4½% "A"	115	103	106	—
5% "A"	123	106¾	114½	—
4½% "T.F.A." ...	105	100⅛	102	—
5% "B"	117½	102	102½	—
"C"	84	63⅞	26½	−1
MERSEY				
Ord.	24½	17½	20½	—
4% Perp. Deb. ...	93⅜	88¾	89½	—
3% Perp. Deb. ...	77	65½	50½	—
3% Perp. Pref. ...	55	49¼	54½	—
IRELAND				
BELFAST & C.D.				
Ord.	6	3	4	—
G. NORTHERN				
Ord.	6	2½	2	—
G. SOUTHERN				
Ord.	13½	8	5	−1
Pref.	26	10	18½	−½
Guar.	40½	22	20	—
Deb.	57	45⅜	39	−1

XUM

Pillinger & Co. Ltd., Rheostatic Co. Ltd., Universal Oil Burners Limited, Urquhart's (1926) Limited, Wallsend Slipway & Engineering Co. Ltd., and J. Samuel White & Co. Ltd.

Irish Stations Competition.—The first prize and cup in the championship class of the "Stations' Improvement Scheme" promoted by the Great Southern Railways Company have been awarded to Goolds Cross on the Dublin–Cork main line.

Requisitioned Wagons.—At the ordinary general meeting of the Cannock Associated Collieries on September 31, Mr. W. H. Harrison, the Chairman, said that the company's railway wagons had been taken under Government control a year before, and were worked from a common pool to meet the needs of trade. As the directors were not in a position to supervise wear and tear of these wagons, they had considered it advisable to increase the reserve for depreciation on this item.

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for August, 1940, amounted to $15,513,000, an increase of $2,858,000 in comparison with August, 1939. Working expenses totalled $13,249,000, or $1,500,000 more, leaving net earnings $1,358,000 higher, at $2,264,000. For the first eight months of 1940, aggregate gross earnings were $106,201,000, an increase of $20,080,000 in comparison with the first eight months of 1939, and the net earnings of $17,305,000 showed an advance of $10,422,000.

Canadian National Earnings.—Gross earnings of the Canadian National Railways in August, 1940, were $21,220,188, an increase of $4,864,732 in comparison with August, 1939. Operating expenses amounted to $17,552,007, with an increase of $1,834,754, resulting in net earnings of $3,668,181, which were $3,029,978 higher than those of August, 1939. Aggregate gross earnings for the first eight months of 1940 totalled $157,296,771, an increase of $37,696,137 in comparison with the first eight months of 1939, and the net earnings of $24,040,849 show an improvement of $23,693,137.

Egyptian Delta Light Railways Limited.—At the annual meeting on September 26, Sir Montagu Sharpe, K.C., the Chairman, said that the financial position of the company was serious and had necessitated obtaining a moratorium in respect of the interest on the 5 per cent. debentures. The war had had a very adverse effect on business in Egypt and had greatly increased the cost of running the railway, without compensating advantages to the company. The company had received permission to increase its rates and fares but in the case of fares had not been able to use that permission fully because of competition from motor vehicles. The increased rates and fares had not so far had the effect of improving receipts, which since the close of the financial year to the end of August had fallen some £7,000.

Staff and Labour Matters

A.R.P. Fire Watchers

The Minister of Home Security has recently issued an order making compulsory the provision of fire watchers in premises (other than mines and quarries) in which more than 30 persons work, and in the following premises irrespective of the number of persons employed :—

(*a*) Any building, the whole or any part of which is used as a warehouse of a greater capacity than 50,000 cu. ft., except when the warehouse is empty ; and

(*b*) Any saw-mill or timber yard containing more than 50,000 cu. ft. of timber.

The order provides that the person who has undertaken to act as fire watcher shall—

(i) Be present on the premises or the part of the premises at all times during the period for which he has undertaken to act as fire watcher ; and

(ii) During a period during which a hostile attack is in progress in the vicinity or an air raid warning is in operation, be in readiness to detect outbreaks of fire and to summon assistance and to use such fire fighting appliances as may be available.

Work During Air Raids

Two statements urging works to keep up production by carrying on after the sirens have sounded were made on behalf of the Government on September 22. Miss Ellen Wilkinson, Parliamentary Secretary to the Ministry of Pensions, in a broadcast, said that to win the battle of Britain two things must be done—we must keep production going and keep life as normal as we could. On the question of liability for war injuries she said that, under the Personal Injuries Act, 1939, the relief for the owner or occupier of premises from liabilities for war injuries was complete. The shopkeeper and factory owner were under no liability if they permitted customers to remain or men to work during a raid. The Government shouldered complete liability for war injuries for the worker.

The scheme for war injuries had nothing to do with the Workmen's Compensation Act. It was a scheme by itself, with very simple regulations, administered by the Minister of Pensions of a Government which appealed to the workers to stay at work as long as they reasonably could after the sirens had sounded and to get back to work even before the "all clear," once the imminent danger had passed. In asking this the Government did not want workers to run risks that were sheerly foolhardy. We wanted to protect the life and health of every worker, but let us keep in mind that any needless stopping of work was an act of surrender to Hitler. It weakened both our military effort and our power of resistance. "You get on with the job, and you can rely on the Ministry of Pensions to look after the casualties and their dependants with all the sympathy and consideration due to those who have stood by their duty on the eve of their country's triumph."

In a call to aircraft workers for increased production, Lord Beaverbrook, Minister for Aircraft Production, issued this message : "I have seen the statements in the press about some workers in several aircraft factories taking shelter throughout the period of air raid warnings. I declare that aircraft factories must be prepared to work after the siren has sounded. It is imperative that there should be a considerable increase in output in the coming week. For the testing time may come upon us very shortly. It is the duty of aircraft factories to supply the men on the fighting front with all the aircraft they require. The men and women of the aircraft industry up and down the country promised that they would fulfil the needs of the Royal Air Force. That pledge has been made good in the past. We will not fail the pilots in the days to come."

Payment for Air Raid Time Lost

The National Arbitration Tribunal has laid down an important principle in two awards fixing the payment to be made for working time lost through air raid warnings. In one case the claim was made by the National Association of Unions in the Textile Trade against the Wool (and Allied) Textile Employers' Council and in the other by the National Union of General & Municipal Workers against the Woolcombing Employers' Federation. The awards of the tribunal are that in respect of time lost up to two hours on any shift and not exceeding eight hours in any week, compensation is to be paid to time workers at the full normal time rate, and for any additional time lost the compensation is to be at one-half this rate. Piece workers will have equivalent compensation. To each award there is a proviso that where time is lost owing to interruption a worker shall, if required (and in so far as it is not inconsistent with the requirements of the Factories Act, 1937, or any other legislation regulating hours of employment), in the same week, or in the week immediately following, make up the time lost up to two hours before or after the ordinary shift, and a maximum of eight hours in any week, at the full normal rate appropriate. A worker who declines, without good reason, to make up the time lost, as required, will not be entitled to compensatory payments. The tribunal states that, if the circumstances of the industry change, a revision of the award may become necessary.

NEW MACHINE TOOLS AT DONCASTER.—In the description of the new Webster & Bennett duplex boring and turning mill at page 331 of our issue last week, it should have been stated that the table used for the machining of such details as locomotive cylinder and steam chest covers is fitted with reverse motion.

Railway and Other Reports

San Paulo (Brazilian) Railway Co. Ltd.—The directors have declared an interim dividend on account of the year 1940 of 2½ per cent., less tax, on the 5 per cent. non-cumulative preference stock, payable on October 25. Consideration of an interim dividend on ordinary stock is deferred.

Isle of Thanet Electric Supply Co. Ltd.—Owing to prevailing conditions the payment of further dividends on the 6 per cent. preference shares has had to be postponed. The present title of this company dates from 1924, superseding the former name of Isle of Thanet Electric Tramways & Lighting Co. Ltd. The tramways were abandoned on March 24, 1937, and were replaced by bus services. The transport undertaking was transferred to the East Kent Road Car Co. Ltd. on October 1, 1936.

Murex Limited.—Final dividend is 10 per cent. and cash bonus 2½ per cent. making a total of 20 per cent. again.

British Insulated Cables Limited.—Interim dividend is 5 per cent. less tax (same).

Potteries Motor Traction Co. Ltd.—Interim dividend is 4 per cent., less tax (same).

Churchill Machine Tool Co. Ltd.—Interim dividend is 15 per cent., less tax (the same).

Hoffmann Manufacturing Co. Ltd.—Interim dividend is 7½ per cent., tax free (same).

Thos. Firth & John Brown Limited.—Interim dividend is maintained at 6 per cent. actual, tax free.

Clayton Dewandre Co. Ltd.—Interim dividend is 4 per cent., less tax (against 3½ per cent.).

United Steel Companies Limited.—Final dividend for year to June 30, 1940, is repeated at 5½ per cent. again making 8 per cent. for the year.

Callender's Cable & Construction Co. Ltd.—The directors have declared an interim dividend of 5 per cent., the same as a year ago.

West Riding Automobile Co. Ltd.—An interim ordinary dividend has been declared of 4 per cent. actual, less tax, the same as a year ago.

R. & W. Hawthorn Leslie & Co. Ltd.—The directors recommend a final dividend of 7 per cent. (less tax) and a bonus of 2½ per cent. (tax free), making 10 per cent., less tax, for the year ended June 30, 1940, in addition to the bonus. These are the same as for 1938-39.

Craven Brothers (Manchester) Limited.—Interim dividend is 4 per cent. less tax, against 7½ per cent. Directors state reduction is due to vulnerability of the company to wartime taxation and additional cash requirements of the business. The works continue to be employed at maximum capacity.

Northern General Transport Co. Ltd.—An interim dividend of 4 per cent. is announced, the same as a year ago.

W. T. Henley's Telegraph Works Co. Ltd.—Interim dividend again 5 per cent., less tax.

Ransome & Marles Bearing Limited.—Net profit after tax for year to June 30, 1940, was £163,038 (against £160,038). Special provision of £35,000 is made for taxation and £35,000 is placed to special depreciation reserve. A final dividend of 11 per cent. (again making 20 per cent.) for the year. The amount carried forward is £77,735 (against £72,922).

National Steel Car Corporation Limited—Financial statement for fiscal year ended June 30, 1940, shows a wide expansion in operating earnings, but because of an increase of nearly $800,000 in depreciation provision, an advance of over $200,000 in amortisation provision, plus higher income taxes, there is shown a reduction in net profit for the year from $630,106 to $463,459, or from $3·58 a share to $2·64. Operating profit at $1,957,044 compares with $1,082,965 a year ago. After salaries, fees, and so forth, and after crediting miscellaneous income, the balance before depreciation was $1,878,379, against $1,023,393. Depreciation at $921,065 compared with $151,999, and amortisation at $318,853 went against $105,826. The balance sheet shows current assets of $5,201,500 exceeding current liabilities by $2,706,790, which compares with $2,765,483 a year ago. Almost $1,000,000 was spent in the completion of the corporation's aircraft plant on the Toronto-Malton airport.

REQUISITIONED WAGONS.—The Minister of Transport has made an Order (S. R. & O. No. 1642) requisitioning all privately-owned wagons constructed since August 1, 1940, other than the customarily exempted classes. The Order, which is dated September 5, 1940, is in extension of previous similar Orders. It is signed on behalf of the Minister by Mr. Gilbert S. Szlumper, Railway Control Officer in the Ministry.

B.S.S. FOR PORTLAND AND HIGH ALUMINA CEMENT.—A new edition of the British Standard Specification (B.S. 12-1940) for portland cement has just been issued, and contains an amplification to include cement of the rapid-hardening type, for which there has hitherto not been a specification. Another modification is the substitution of a compression test on a cement-sand mortar cube for the old tensile strength test of a standard briquette. The general form of the specification for high alumina cement (B.S. 915) is similar to that of B.S. 12. Copies may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 3d. each, post free.

Contracts and Tenders

The Clyde Engineering Co. Ltd., N.S.W., has been awarded a contract for two "Q" class steam locomotives by the Tasmanian Government Railways, at a cost of £18,940 each.

The Peruvian Corporation has placed contracts for two boilers, one, a Class "7," with the Hunslet Engine Co. Ltd., and another, a Class "80" with Robert Stephenson & Hawthorns Limited.

The Bengal-Nagpur Railway has ordered Superheater headers from the Superheater Co. Ltd.

A contract for the electrification of a section of the Sorocabana Railway Brazil, has been awarded the Electrical, Export Corporation, an American concern combining the U.S. General Electric and Westinghouse Companies. The value of the contract is about £1,250,000 and involves the electrification of some 330 km. (205 miles) of track and the provision of equipment, including 20 locomotives. As described in our Electric Traction Supplement of June 21 last (p. 68), the scheme comprises a double line of metre gauge 140 km. (87 miles) long between São Paulo and São Antonio via Sôrocaba, together with the Des Rios branch. The American bid was at $6,679,943 (about £1,669,873) plus 19,744 contos, making a total of about 153,000 contos. The English Electric Company put in tenders for alternative equipment, one for £1,216,211, plus 27,920 contos, making a total of some 113,000 contos, and another for £1,124,211 plus 27,710 contos, totalling about 106,000 contos. Metropolitan-Vickers Electrical Export Co. Ltd. put in a quotation of £1,522,930, plus 11,387 contos, or about 117,000 contos in all; alternatively it bid £1,357,990, plus 15,522 contos, totalling approximately 110,000 contos, if concrete instead of steel poles were used. The Electrical Export Corporation offered payment over ten years in six-monthly instalments for dollars, and five years for currency. The English Electric Company stipulated that prices should be subject to confirmation and Metropolitan-Vickers' prices were firm, with monthly payments over five years.

The South African Railways & Harbours Administration is calling for tenders (No. 2880) for the supply and delivery of quantities of dry red and white lead. Tenders should reach the Chief Stores Superintendent, Purchase Section, Room 3, Park Chambers, Rissik Street, Johannesburg, by 3 p.m. on October 25.

The South African Railways & Harbours Administration invites tenders (No. 2879) for the supply and delivery of quantities of leadless white paint in paste. Tenders should reach the Chief Stores Superintendent, Purchase Section, Room 3, Park Chambers, Rissik Street, Johannesburg, by 3 p.m. on October 18.

XUM

Railway Stock Market

The stock and share markets showed a reactionary tendency early in the week, but subsequently gilt-edged securities rallied, and the undertone in other sections of the Stock Exchange improved. Earlier fears that markets might be affected by the Japanese pact with the Axis powers were unfounded, and sentiment was again assisted by the absence of selling pressure, although, partly because of the air raids, the volume of business has been very limited. Home railway securities were steady, nevertheless, and movements on balance have been fractional in character. The prevailing view is that current prices more than discount the adverse factors arising from the war, and that most of the junior stocks are at levels which do not allow fully for the dividend estimates which can reasonably be based on the financial agreement with the Government. Despite their excellent investment merits, debenture stocks of the main-line railways have not reflected the better tendency in gilt-edged stocks, and in some instances they are slightly lower as compared with a week ago. Had conditions on the Stock Exchange been active, it is quite possible railway securities would now be showing some response to the fact that so far, air raid damage suffered by the railways has been much less than might have been expected; there has been further evidence of the rapidity with which repairs can be effected. There has, of course, been little selling of debenture stocks, but owing to inactive markets and limited demand, the tendency at the present time is for a very small amount of liquidation to have a disproportionate influence on quotations of all classes of securities. The fact that many railway stocks have been well maintained on balance would appear to indicate that very little selling has been experienced, and that holders are prepared to take more than a short view, because railway securities can be expected to show response in price, when conditions on the Stock Exchange become reasonably active.

Great Western ordinary stock has remained at 28, and the 5 per cent. preference at 73½ was also the same as a week ago. On the other hand, the 5 per cent. guaranteed at 103½ and the 4 per cent. debentures at 101½ had an easier appearance. L.M.S.R. 4 per cent. senior preference was unchanged at 43½, as was the 1923 preference at 30½; the ordinary stock remained at 11½. At 72½, L.M.S.R. guaranteed stock was fractionally lower, and the 4 per cent. debentures were a point down at 89, although the 5 per cent. debentures were again 106. A steady tendency ruled in L.N.E.R. guaranteed issues, the firsts at 63½, and the seconds at 53½, both being the same as a week ago. L.N.E.R. first preference at 27½ failed to recover from the decline shown a week ago, and the second preference was 9½. Moreover, the 3 per cent. debentures of the same company were again 61½, and the 4 per cent. debentures also showed no change at 81½.

Southern preferred, which was 40 a week ago, has since eased to 39½, and the deferred was unchanged at 9½, but the 4 per cent. debentures have reacted, and were obtainable at 94. London Transport "C" stock remained at 27½ but was inactive, and the 4½ per cent. "A" stock was again 106.

Argentine railway securities attracted very little attention; with few exceptions, quotations were unchanged. Elsewhere, San Paulo ordinary was 31, and Antofagasta preference 19½. Canadian Pacific preference had an easier appearance at 44, despite the very good traffic figures for August. Gains of a point were recorded in the quotations for various Indian railway stocks.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1939-40	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1939	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1939	Prices: Lowest 1939	Prices: Oct. 1, 1940	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	22.9.40	12,340	+ 2,280	38	650,200	500,220	+ 149,980	Ord. Stk.	10⅜	4½	5½	Nil
	Argentine North Eastern ...	753	21.9.40	ps. 166,100	– ps. 14,900	12	ps. 2,100,600	ps. 2,199,100	– ps. 98,500	,,	4½	2	2	Nil
	Bolivar	174	Aug. 1940	3,550	– 1,350	35	32,180	34,050	– 1,870	6 p.c. Deb.	7½	5¾	6½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	5¼	4½	6*	Nil
	Buenos Ayres & Pacific ...	2,801	21.9.40	ps.1,125,000	–ps.100,000	12	ps.13,329,000	ps. 14,900,000	–ps.1,571,000	Ord. Stk.	5½	2	2	Nil
	Buenos Aires Central ...	190	27.7.40	$94,400	– $40,000	4	$352,600	$409,600	– $57,000	—	—	—	—	—
	Buenos Ayres Gt. Southern	5,082	21.9.40	ps.1,789,000	–ps.114,000	12	ps.22,716,000	ps. 22,863,000	–ps. 147,000	Ord. Stk.	13⅜	4½	4½	Nil
	Buenos Ayres Western ...	1,930	21.9.40	ps. 625,000	–ps.177,000	12	ps. 7,387,000	ps 8,288,000	–ps. 901,000	,,	10½	4	4	Nil
	Central Argentine	3,700	21.9.40	ps.1,362,550	–ps 549,600	12	ps.16,980,350	ps. 24,789,250	–ps7,808,900	,,	11¼	4	4	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4	1½	2	Nil
	Cent. Uruguay of M. Video ...	972	21.9.40	18,138	+ 2,601	12	208,369	198,936	+ 9,433	Ord. Stk.	2¼	7/16	1½	Nil
	Costa Rica	188	May 1940	17,282	– 7,020	48	193,339	245,516	– 52,177	Stk.	24½	18	17½	11⅜
	Dorada	70	Aug. 1940	13,300	– 900	35	98,500	109,300	– 10,800	1 Mt. Db.	104½	102	98	6 7/16
	Entre Rios	810	21.9.40	ps. 219,900	– ps. 57,300	12	ps. 2,852,100	ps. 3,361,900	–ps. 509,800	Ord. Stk.	6	3	1½	Nil
	Great Western of Brazil ...	1,016	21.9.40	8,100	– 1,100	38	368,000	301,400	+ 66,600	Ord. Sh.	3/–	1/2½	7/16	Nil
	International of Cl. Amer. ...	794	July 1940	$419,682	– $43,933	30	$3,724,774	$3,679,627	+ $27,147	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	7½d.	7½d.	½	Nil
	La Guaira & Caracas	22¾	Aug. 1940	6,445	– 990	35	52,060	49,355	+ 2,705	—	—	—	—	—
	Leopoldina	1,918	21.9.40	25,450	– 1,389	38	854,596	769,584	+ 85,012	Ord. Stk.	2½	½	1	Nil
	Mexican	483	14.8.40	ps. 239,700	–ps. 10,200	6	ps. 1,744,500	ps. 1,772,300	–ps. 27,800	,,	1⅜	¼	⅛	Nil
	Midland of Uruguay	319	July 1940	10,223	+ 1,081	4	10,223	9,142	+ 1,081	—	—	—	—	—
	Nitrate	386	15.9.40	8,116	+ 4,217	37	128,115	84,001	+ 44,114	Ord. Sh.	2⅛	1½	1⅜	7 1/16
	Paraguay Central	274	21.9.40	$3,308,000	+ $123,000	12	$42,111,000	$41,668,000	+ $443,000	Pr. Lt. Stk.	45½	36	38	15¾
	Peruvian Corporation ...	1,059	Aug. 1940	69,178	+ 7,745	9	134,599	125,839	+ 8,760	Pref.	1 7/16	7/16	1½	Nil
	Salvador	100	3.8.40	c8,584	– c5,416	5	c54,545	c58,932	– c4,387	—	—	—	—	—
	San Paulo	153½	15.9.40	30,250	+ 1,412	37	1,365,844	1,196,648	+ 169,196	Ord. Stk.	38	20	31	8 1/16
	Taltal	160	July 1940	2,085	+ 530	4	2,085	1,555	+ 530	Ord. Sh.	⅜	6/6	½	9¾
	United of Havana	1,353	21.9.40	14,532	– 4,618	12	188,146	213,876	– 25,730	Ord. Stk.	2	¼	¼	Nil
	Uruguay Northern	73	July 1940	930	+ 106	4	930	824	+ 106	—	—	—	—	—
Canada	Canadian National	23,695	21.9.40	1,008,677	– 121,558	38	34,384,993	26,945,135	+ 7,439,858	—	—	—	—	—
	Canadian Northern ...	—	—	—	—	—	—	—	– 4 p.c.	Perp. Dbs.	74⅜	60	74	5⅜
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	100½	76	102	3 14/16
	Canadian Pacific	17,153	21.9.40	707,400	– 194,400	38	23,350,600	19,892,000	+ 3,458,600	Ord. Stk.	7⅜	3½	5½*	Nil
India†	Assam Bengal	1,329	30.4.40	45,187	+ 6,529	4	135,060	120,437	+ 14,623	Ord. Stk.	76½	60	72½	4⅛
	Barsi Light	202	July 1940	22,762	+ 13,320	18	56,587	43,395	+ 13,192	—	—	—	—	—
	Bengal & North Western ...	2,091	Aug. 1940	204,825	+ 34,908	22	1,251,276	1,076,424	+ 174,852	Ord. Stk.	277	229½	240	6 11/16
	Bengal Dooars & Extension ...	161	July 1940	14,043	+ 2,966	18	49,776	37,677	+ 12,099	,,	91	84½	215	3
	Bengal-Nagpur	3,269	20.7.40	219,450	+ 31,965	16	2,610,743	2,443,807	+ 166,936	,,	94⅜	83½	91	4⅜
	Bombay, Baroda & Cl. India...	2,986	20.9.40	254,325	+ 1,200	24	4,485,825	3,970,350	+ 515,475	,,	108	90	104	5¼
	Madras & Southern Mahratta	2,967	31.7.40	152,700	– 1,977	18	2,074,489	2,057,371	+ 17,118	,,	104 11/16	92	99½	7½
	Rohilkund & Kumaon ...	571	Aug.1940	40,125	+ 5,832	22	282,833	224,369	+ 58,464	,,	280	263	250	6⅜
	South Indian	2,542	20.7.40	121,599	+ 10,755	16	1,390,463	1,294,081	+ 96,382	,,	102½	88	84½	5 1/16
Various	Beira	204	July 1940	83,043	—	43	747,446	—	—	—	—	—	—	—
	Egyptian Delta	623	10.5.40	4,591	– 602	6	19,436	20,384	– 948	Prf. Sh.	½	¼	½	Nil
	Kenya & Uganda	1,625	—	—	—	—	—	—	—	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	55	39	47½	7⅜
	Midland of W. Australia ...	277	June 1940	10,926	– 618	52	156,230	177,307	– 21,077	Inc. Deb.	91½	87½	82½	4⅛
	Nigerian	1,900	27.7.40	29,016	+ 2,233	18	631,889	480,613	– 151,276	—	—	—	—	—
	Rhodesia	2,442	July 1940	442,978	—	43	3,916,232	—	—	—	—	—	—	—
	South Africa	13,287	24.8.40	720,265	+ 74,023	21	14,087,812	13,411,926	+ 675,886	—	—	—	—	—
	Victoria	4,774	June 1940	797,185	+ 103,739	52	9,942,449	9,360,329	+ 582,120	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of 1/16 Argentine traffics are now given in pesos
* Quotation is of June 17, 1940; dealings subsequently prohibited † Receipts are calculated @ 1s. 6d. to the rupee